

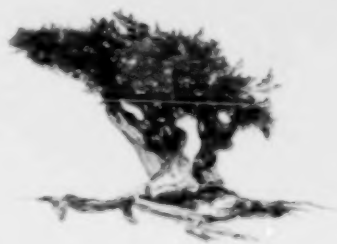
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draft
general management plan
development concept plans
environmental impact statement

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NATIONAL PARK • NEVADA



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**Draft
General Management Plan
Development Concept Plans
Environmental Impact Statement**

**Great Basin National Park
White Pine County, Nevada**

This *Draft General Management Plan/Development Concept Plans/Environmental Impact Statement* describes and analyzes a proposed action and three alternatives for future management and use of Great Basin National Park, which was established in 1986. The proposed action would diversify visitor opportunities by expanding interpretation, improving access to and within the park, constructing a new visitor center, and adding new camping and trail facilities. Administrative support facilities would be moved to an area outside the park. The park would be zoned to protect natural resources. Grazing would continue but would be more closely regulated. Any future mining activity would be subject to National Park Service mining regulations. **Alternative A** would open no new areas to visitors, and few new facilities would be provided. Support facilities would remain in the park. Resource protection would remain at present levels. Grazing would be less restricted than under the proposed action but would be subject to regulation. Mining would be regulated as under the proposed action. **Alternative B** would offer maximum natural resource protection. Most of the park would be designated as part of the primitive and special protection subzones. Visitor use would be concentrated in existing use areas, and support facilities would be moved outside the park. Grazing would be allowed but would be subject to more stringent control than under the proposed action. Mining would be regulated as under the proposed action. **Alternative C** would provide the most extensive park development, with more areas accessible by car or four-wheel-drive vehicle and fewer areas reserved for primitive experiences. Support facilities would remain in the park. Grazing would be somewhat less restricted than under the proposed action. Mining would be regulated as under the proposed action. Major impact topics assessed for the proposed action and alternatives include natural and cultural resources, the socioeconomic environment, including the local and regional economy, and NPS and other agency operations.

Comments on the plans and environmental impact statement should be received no later than December 31, 1991. Comments should be submitted to

Superintendent
Great Basin National Park
Baker, Nevada 8938

For additional information, please contact the park at the above address or telephone (702) 234-7331.

United States Department of the Interior / National Park Service

SUMMARY

This *Draft Environmental Impact Statement* presents a proposed action and three alternatives for management, use, and development of Great Basin National Park for the next 15 years. The proposed action constitutes the National Park Service's preferred alternative and draft general management plan/development concept plans.

The proposed action and alternatives have been formulated to address problems and management concerns related to visitor use (access, increased parkwide visitation, concentrations of visitors at traditional use areas, and inadequate facilities and programs to tell the Great Basin story), resource management (valid existing mining claims, continuation of congressionally authorized grazing), protection of federal and state threatened and endangered plants and animals, and preservation of important scenic, natural, geologic, and cultural resource values (including the viewshed from Wheeler Peak, the bristlecone pine forests, the Wheeler Peak cirque, and the Osceola ditch). These issues and concerns were identified in a series of meetings held with concerned government agencies and the public over a two-year period from July 1987 to July 1989.

The proposed action and alternatives are described below along with the environmental consequences of implementing them. All of the alternatives have been designed to protect and preserve exceptional resources and to meet identified planning objectives. The objectives reflect the park purpose established in the authorizing legislation (PL 99-565) "to preserve for the benefit and inspiration of the people a representative segment of the Great Basin of the Western United States possessing outstanding resources and significant geological and scenic values." Resources of particular concern include the large stands of bristlecone pine, the biologically productive riparian areas; water quality in park lakes and streams; the fragile alpine and subalpine areas; all endangered, sensitive, protected, and candidate plant and animal species, including the Bonneville cutthroat trout and peregrine falcon; the park's biological diversity; all of the limestone outcrops and formations, which contain more than 30 known natural caverns; the glacial cirques, tarns, glacier, and rock glacier; air quality and the vistas across the two broad valley basins to the east and west; and the park's archeological and historic resources, three of which are listed on the National Register of Historic Places.

The proposed action and alternatives reflect a management zoning concept that focuses on diversity in recreational experiences. The zoning concept includes three zones and seven subzones: park development zone - modern subzone; natural zone - rural, semi-primitive day use, semi primitive, primitive, protected natural area, and research natural area subzones; and special use zone. The concept provides for a wide range of experiences consistent with Park Service mandates, policies, and guidelines - thus avoiding the limitations of offering only frontcountry (modern and developed) and backcountry (primitive and undeveloped) uses. The semi-primitive, semi-primitive day use, and rural subzones play a key role in establishing a continuum of experiences between the extremes of "paved and primeval."

The proposed action focuses on diversifying visitor opportunities by expanding interpretation of significant features in the park and the Great Basin physiographic region, improving access to and within the park, constructing a new visitor center, and offering new ways to view and appreciate the park's many resources. The zoning concept has been applied to provide a balanced range of recreational opportunities. Most visitors would continue to concentrate in the Lehman Cave and Wheeler Peak areas - the primary interpretive areas at present - and two subzones (the modern and semi-primitive day use subzones) would be established in these areas to accommodate relatively high levels of use and permit visitors to easily reach and view many of the park's significant features. For visitors wishing to escape the mainstream of tourist activity, the rural subzone would provide opportunities for fishing, hiking, and dispersed camping in more remote areas. The southern portion of the park would be opened to more backcountry use by including large areas in the semi-primitive subzone and constructing trails that would allow visitors to hike the entire length of the park from north to south. Areas with special resource needs and concerns, in particular the alpine and subalpine areas above 10,500 feet, would be included in the protected natural area and research natural area subzones. The remainder of the park would constitute the primitive subzone. Primary road access to the park would be from the east side of the Snake Range.

PROPOSED
ACTION

Management
Zoning

Visitor Use
and
Development

Opportunities to experience representative portions of the Great Basin would increase under the proposed action, and interpretation would be expanded. Major facilities to support interpretation would include the new Wheeler Peak Scenic Drive and 11 associated pullouts (the scenic drive would include the existing 12-mile Wheeler Peak road and a new 7-mile eastern extension that would pass through the basin environment), the new Great Basin visitor center on Baker Ridge, and the rehabilitated Lehman Cave interpretive center, which would focus on cave interpretation. Four regional interpretive exhibit shelters would be established along the major highways leading to the park, and a new park orientation center would be built on an 80-acre administrative site near the town of Baker. Interpretive exhibit panels at the scenic drive pullouts and in other park areas would provide site-specific interpretation about the life zones and natural and cultural features visible from the sites. Most interpretive developments would be accessible to disabled and elderly visitors.

Other visitor facilities would include campgrounds and campsites, roads, trails, trailheads, and a parkwide system of trailhead orientation exhibits and campground information shelters. Facilities would be limited to those necessary to achieve the major planning objectives for the park – the protection of park resources and values and the provision of recreational activities that inspire visitors and contribute to their understanding and appreciation of the park. Approximately 180 campsites would be maintained or built in the modern and rural subzones. Except for the new portions of Wheeler Peak Scenic Drive and several short spur roads, existing roads would provide access to park developments. Paved roads would lead to developments in the modern subzone; two-wheel-drive gravel or dirt roads would serve rural subzone developments. All other areas of the park would be accessible only on foot or horseback. About 60 miles of existing trails would be upgraded and maintained, and 24 miles of new trails would be constructed to link existing trails; roughly 64 miles would be open to horseback riders, and corrals would be provided at several of the trailheads. Five or six backcountry camps would be designated in the remote central and southern parts of the park.

Under the proposed action most existing and all proposed NPS operational support functions would be relocated from the Lehman Cave area to the 80-acre administrative site near Baker. Relocation of these functions would permit a number of administrative, maintenance, and housing facilities that are currently in a prime resource area to be removed

The Baker site would have three components – a 3,000-square-foot administrative facility, a 5-acre maintenance compound, and a residential area with six single-family units and 20 to 30 apartment units – and it would provide room for expansion in the future. The only administrative and housing facilities that would be maintained in the park would be those needed to protect park resources.

Natural resource management activities under the proposed action would recognize that Great Basin National Park comprises only a portion of a much larger ecosystem centered around the South Snake Range. The park would be managed as an integral part of this larger ecosystem, and full consideration would be given to the potential effects of actions inside and beyond park boundaries. The following specific actions would be taken.

Natural
Resource
Management

The grazing of domestic livestock would continue in the park in accordance with the enabling legislation, except in the semi-primitive day use, protected natural area, and research natural area subzones (alpine/subalpine areas above 10,500 feet, the Wheeler Peak and Mt. Washington areas, and Pine and Ridge creeks). The Park Service would develop and use sound range management techniques, consistent with NPS policies and guidelines, to minimize grazing's adverse effects on exceptional resources such as riparian areas and rare and sensitive plant species. In addition, to reduce the recurring conflicts between park visitors and livestock, methods would be used to separate cattle and sheep from visitors. The allotment management plans to be completed in 1991 would prescribe methods for managing each of the grazing allotments in the park.

There are 247 mining claims in the park, most (238) in the immediate vicinity of Mt. Washington and many in the heart of the ancient bristlecone pine forest. The Park Service would continue to recognize all valid existing mining claims in the park and to monitor and enforce the regulations governing mining within park boundaries. Mining plans of operations would be reviewed under the provisions of the Mining in the Parks Act and its implementing regulations (36 CFR 9A). The Park Service would continue to examine the validity of all existing mining claims within park boundaries. If a claim was found to be invalid, the Service would recommend to the Bureau of Land Management that the claim be extinguished. To reduce the effects of past mining activity, abandoned mining shafts, equipment, and materials that are not historically significant would be secured or removed, and mining sites and access routes would be rehabilitated by the park staff as funds were made available.

Any identified impacts on water quality would be mitigated. Mining claimants would also be required to secure or remove any shafts, equipment, and materials that might present safety hazards.

The Park Service would continue to cooperate with the Nevada Department of Wildlife in managing fish and wildlife. In consultation with the department, the Park Service would reestablish Bonneville cutthroat trout into selected streams on the east side of the park. The drainages containing populations of Bonneville cutthroat trout on the west side would be zoned as protected natural areas, and domestic sheep grazing would be prohibited within those areas. No new stocking of nonnative fish species would be permitted in park waters. The Park Service would continue to cooperate in all efforts to reestablish the peregrine falcon. All native predators would be strictly protected within the park boundaries, and the Park Service would work with surrounding land management agencies to ensure that populations of predators are maintained at natural levels.

Other natural resource management actions would include inventorying the extent of plant and animal diversity and identifying forces that might affect that diversity; cooperating in firefighting activities in the region and developing a wildland fire management plan for the park; inventorying all caves in the park and preparing a cave management plan; gathering baseline water quality data; and cooperating in all regional efforts to maintain pristine air quality and reduce existing and potential air pollution effects. The park is designated as a class II area under the Clean Air Act as amended.

all proposals for major developments or activities that might affect the visual integrity of the valleys. Grazing, small agricultural developments, and daily ranching activities would not be subject to viewshed evaluation.

Other land protection actions would include cooperating with the Bureau of Land Management and state agencies to develop and use the regional exhibit shelters; cooperating with the Forest Service to develop and use parking area/trailheads at the ends of the Big Wash and Lexington Arch approach roads; negotiating with the Forest Service to effect transfer to the park of two sections of Forest Service land along the eastern boundary; and obtaining rights-of-way from the Bureau of Land Management and Forest Service for access to the park along the proposed park entrance road and the Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch roads. An easement would also be sought from the landowner for the portion of the Big Wash trail that crosses private land.

A long-range land protection goal would be to submit a recommendation to Congress for a boundary addition in the area delineating the western park boundary adjacent to Mt. Washington and to acquire all patented claims in this area on a willing-seller basis to ensure preservation of the nationally significant bristlecone pine resource. Until that time, the Park Service would work with property owners and local, county, and state officials to ensure protection of resource values.

The proposed action would have generally beneficial effects on the park's biological and physical resources. Bristlecone pine forests would receive additional protection because vehicular access to the Mt. Washington stand would be prohibited, trails in the Wheeler Peak stand would be improved to reduce random pedestrian traffic, and all other known stands would be included in the protected natural area subzone. Riparian areas and water quality would continue to be adversely affected by domestic livestock grazing, but to a lesser extent than at present. There would be a net increase of 1 1/4 acres of riparian habitat. Alpine/subalpine areas and rare and sensitive plant species would also receive increased protection because domestic livestock grazing would be prohibited above 10,500 feet in elevation, new development in these areas would be limited to trails, and the effects of mining and recreational use would be minimized. Additional protection would be provided for peregrine falcon habitat on the west side of the park, and no developments would be built there. Habitat for the existing Bonneville cutthroat trout population in the Pine and

Environmental Consequences

Cultural Resource Management

Under the proposed action historic resources listed on or recommended for nomination to the National Register of Historic Places would be preserved and interpreted. These include the Lehman orchard, Lehman aqueduct, Rhodes cabin, and Osceola ditch. The Johnson mill and mine would be evaluated for eligibility under the National Register criteria. Other historical sites and resources would be left to deteriorate naturally, and interpreted where appropriate. A comprehensive parkwide inventory of archeological resources would be completed to evaluate their contextual significance and interpretive value, and additional ethnographic research and surveys would be accomplished.

Land Protection

To preserve the significant views of the Snake Valley and Spring Valley basins, which are an integral part of the Great Basin experience, the Park Service would review, evaluate, and make recommendations to local governments concerning

SUMMARY

Ridge creek drainages would be further protected by zoning it as protected natural area and eliminating grazing within the subzone. This trout would be reintroduced into east-side streams, expanding it into its original range. There would be few direct effects on the park's biological diversity; the fire management plan might contain provisions to allow natural fires to burn, which would help assure habitat diversity. Two campgrounds would be removed from apparent floodplains (floodplains have not yet been mapped). New road alignments would require construction of two bridge crossings over apparent creek floodplains and associated riparian wetlands. Design of the crossings would minimize the effects on these areas. The total number of developments on areas with the potential for underlying caves would decrease; more developments would be removed from such areas than would be constructed on them. The effects on air quality would be minor. The effects on vistas would be generally positive. Most NPS operational developments would be removed from the park, improving views in and of those areas. The new Baker Ridge visitor center would be visible from several vantage points, but it would be designed and sited to minimize its visual impact. The effect of the building on park vistas would be offset by the benefits of conveying the Great Basin story in a setting that complements its presentation.

Recommended actions for historic and archeological resources would generally upgrade preservation and protection efforts. All historic resources listed on or recommended for nomination to the National Register of Historic Places would be preserved and interpreted.

The proposed action would have only minor effects on nearby residents, property owners, and commercial interests. Current grazing permittees would be required to restrict livestock to certain locations to a greater extent than in the past, but they would be assured the continued availability of grazing allotments in the park. Mining activities would continue to be regulated under the provisions of the Mining in the Parks Act. The potential economic impacts are unknown and would depend on the extent of the deposits and the feasibility of their extraction within the regulations promulgated under the act. Residents and private property owners along the existing entrance road would experience a substantial reduction in traffic volumes and noise after that road was closed to visitor traffic; there would be some increases in traffic and noise south of Baker near the new scenic drive. The proposed action would have a positive impact on the regional economy, but the actual economic benefit would be small. Local park visitors would continue to

have opportunities for many traditional recreational uses. Some consumptive and high-impact recreational activities (for example, hunting, trapping, tree cutting, commercial pine nut harvesting, prospecting, collecting, unrestricted four-wheel driving, undesignated camping, snowmobiling, mountain biking, and hang gliding) would be prohibited or more closely regulated than in the past. The effects on other park visitors would be generally beneficial. Understanding and appreciation of the park would increase, and a greater diversity of recreational opportunities would be provided.

The proposed action would require substantial increases in NPS law enforcement, resource management, and maintenance personnel and funding and slight increases in interpretive personnel and funding. There would be few if any effects on the Forest Service and Bureau of Land Management.

Under alternative A, the no action/minimum requirements alternative, there would be no significant changes in present management and visitor use. Actions would be taken to meet legislative requirements, protect natural and cultural resources, and address health and safety concerns, but no new areas of the park would be opened to visitor use and few additional interpretive or recreational facilities would be provided. Management zoning would reflect these minimal changes. The entire Lehman Cave/Wheeler Peak road area would be included in the modern subzone, and the Wheeler Peak day use area would be designated for semi-primitive day use. Existing weekend camping areas would become part of the rural subzone, and existing hiking and horseback riding areas would be placed in the semi-primitive subzone. The remainder of the park would be zoned primitive and open only to visitors willing to take the time and effort to make their way into the backcountry. No areas would be zoned as protected natural and research natural areas.

Under this alternative the primary visitor attractions would continue to be Lehman Cave and the sights, features, and facilities along the existing Wheeler Peak road; five interpretive pullouts would be designated along this road. The existing Lehman Cave visitor center would be rehabilitated to include both the Great Basin and the cave story presentations, and some parking and access improvements would be made. Existing weekend camping areas in Strawberry, Baker, and Snake creeks would be maintained (approximately 170 campsites would be available in the park), and trail access to Lexington Arch would be provided. Other opportunities in the central and southern parts of the park would be limited and available only to

ALTERNATIVE A - NO ACTION/ MINIMUM REQUIREMENTS

backcountry users. About 36 miles of existing trails would be upgraded and maintained, and 1 mile of new trail would be constructed. Some 31 miles would be available to horseback riders. A new administration building would be constructed near the Lehman Cave visitor center, and most functions would be relocated there. The existing maintenance and housing areas would be retained, and additional housing units would be built nearby.

Actions for natural and cultural resource management would be similar to those of the proposed action except that grazing would continue to be permitted above 10,500 feet, around Mt. Washington, and in the Pine and Ridge creek drainages and Bonneville cutthroat trout would not be reintroduced into streams on the east side of the park.

No immediate land protection measures would be undertaken. A long-range goal would be to submit a recommendation to Congress for a boundary addition adjacent to Mt. Washington and to acquire all patented claims in this area on a willing-seller basis. Until that time, the Park Service would work with property owners and local, county, and state officials to ensure protection of resource values.

Alternative A would have limited beneficial effects on the park's biological, physical, and cultural resources through zoning and resource management actions. However, domestic livestock grazing would continue to have an adverse effect on riparian, alpine, and subalpine areas, water quality, and sensitive plant species, and there would be no additional protection for Bonneville cutthroat trout. NPS operational developments would be retained in the Lehman Cave area and would continue to intrude on views. Two campgrounds would be removed from apparent floodplains, and no additional developments would be built in floodplains or wetlands. Other natural and cultural resources impacts would be the same as those of the proposed action.

There would be no additional impacts on grazing permittees under alternative A. The impacts on mineral interests, the regional economy, and local visitors would be the same as under the proposed action. Residents and property owners along the existing park entrance road would experience increases in traffic volume and noise as park visitation increased. Few new services and interpretive programs would be provided, and opportunities to learn about the park's many natural and cultural features would be limited. Moderate increases in personnel and funding would be required to implement this alternative.

Alternative B would provide a higher degree of protection for natural and cultural resources in the park than any of the other alternatives. Actions proposed in this alternative would fulfill legislative mandates and provide for the health and safety of visitors and staff while promoting resource preservation and protection in large areas of the park. The modern subzone would be smaller than in the proposed action, and more of the central and southern portions of the park would be placed in the primitive and special protection subzones. Staff and funding would be provided to carry out this preservation emphasis and to encourage backcountry use in the central and southern portions of the park. Large areas would be designated as protected natural areas and research natural areas.

ALTERNATIVE B - BACKCOUNTRY EMPHASIS

This alternative would concentrate visitor use in the northern part of the park. Except for Lexington Arch, areas south of Snake Creek would be trailless and accessible to only the most hardy. There would be fewer opportunities to camp in the rural areas of the park (approximately 150 campsites, all north of Snake Creek), but more opportunities to explore the backcountry on foot and horseback. About 38 miles of existing trails and 10 miles of new trails would be established; 30 miles would be open to horseback riders, and two new corrals would be provided. Organized activities would continue to be accommodated at Lehman Cave and along the Wheeler Peak road; six interpretive pullouts would be designated along this road. Orientation, information, and interpretation would be provided at a new visitor center on the administrative site near Baker, and the Lehman Cave visitor center and parking lots would be removed. (A new parking area would be built away from view to support cave tour traffic.) All NPS administration, maintenance, and housing facilities would also be relocated to the Baker administrative site, and development in other park areas would be minimized.

Natural and cultural resource management actions would be similar to those of the proposed action except that grazing would be prohibited in all areas containing sensitive plant species (this would include some lower elevation areas as well as areas above 10,500 feet, the Mt. Washington vicinity, and the Pine and Ridge creek drainages) and Bonneville cutthroat trout would be reintroduced into all east-side streams believed to have historically contained this species. If research confirmed that elk were once resident on the lands within the park, actions would be taken to actively reintroduce this species.

SUMMARY

Land protection actions for the Spring Valley and Snake Valley basins, the regional exhibit shelter sites, and the Strawberry Creek, Snake Creek, and Lexington Arch approach roads would be the same as under the proposed action. In addition, the western park boundary would be expanded to add about 1,850 acres adjacent to Mt. Washington, thus eliminating the irregular boundary alignment referred to as the "keyhole." The boundary recommendation would involve the transfer of surface lands from the Forest Service to the Park Service. It would also include the long-range goal of acquiring all of the valid unpatented and patented mining claims on the 1,850-acre parcel to eliminate the potential for mining or commercial activity along this escarpment. The acquisition of valid unpatented and patented claims would be on a willing-seller basis only.

The impacts of alternative B on the park's biological, physical, and cultural resources would be similar to those of the proposed action except that protection measures would be more extensive. More of the park would be zoned as primitive or special protection areas, and more restrictions might be placed on grazing permittees. Trout reintroductions would also be more extensive on the east side of the park. No new developments would be built on areas with the potential for underlying caves, and a number of developments would be removed from them. All NPS operational developments would be relocated out of the Lehman Cave developed area, improving views in and of this area.

The impacts on grazing permittees, mineral interests, the regional economy, local visitors, and park management and operations would be similar to those of the proposed action. The impacts on local residents and property owners would be similar to those of alternative A. Few additional frontcountry services would be provided under this alternative, but opportunities to explore and appreciate the park's backcountry would increase.

ALTERNATIVE C - ACCESS EMPHASIS - Alternative C would involve the most extensive development of the park. More areas would be accessible by car or four-wheel-drive vehicle, and fewer areas would be set aside for isolated, primitive experiences. Under this alternative, modern and rural subzone areas would extend along the entire length of the park's eastern boundary, and three semi-primitive day use subzones would be established to encourage visitors to use the northern, central, and southern portions of the park, including the Mt. Washington area. An expanded backcountry trail system in the semi-primitive

subzone would allow visitors to traverse the park from north to south. The primitive subzone would be limited to a few remote and isolated areas. No protected natural area or research natural area subzones would be designated.

Facilities to support interpretation would be extensive under this alternative and similar to those of the proposed action except that the new Great Basin visitor center would be built in Kiou Basin and the new Wheeler Peak Scenic Drive would be routed to pass through this area. Interpretive opportunities would also be expanded in the southern portions of the park, and visitors would have many options for viewing and learning about park resources and the Great Basin physiographic region. Paved access would be provided into the Kiou Basin, Baker Creek, and Snake Creek areas as well as to Lehman Cave and the Wheeler Peak day use area, and four-wheel-drive access would be provided to the Mt. Washington area. A new visitor contact/interpretive facility would be developed near Lincoln Canyon to support use on the west side of the park. A number of new campgrounds and campsites would be designated (there would be a total of approximately 270 campsites), and hiking and horse trails would extend into most backcountry areas. Approximately 60 miles of existing trails and 25 miles of new trails would be established. About 64 miles of trails would be available to horseback riders, and several new corrals would be provided. Five or six backcountry camps would be designated.

Under alternative C all operational support functions would remain in the park. A new administration building would be constructed in the Lehman Cave area, and a new maintenance complex would be built in the vicinity of the existing sewage lagoons. Park housing would be expanded in the existing residential area.

Natural and cultural resource management actions would be similar to those of the proposed action except that alpine areas above 10,500 feet and the Pine and Ridge creek drainages would not be zoned as protected natural areas, and grazing would continue to be permitted there. Bonneville cutthroat trout would be reestablished in all streams on the east side of the park that are believed to have historically contained them. No attempt would be made to actively establish an elk herd in the park; however, no action would be taken that would prevent a herd from becoming established on its own.

Land protection actions for the Spring Valley and Snake Valley basins, the regional exhibit shelters, the rights-of-way,

cooperative agreements, and easements, and the patented lands adjacent to the southwestern park boundary would be the same as in the proposed action. A cooperative agreement would be established with the Forest Service for NPS management and maintenance of the portion of a proposed trail corridor that would cross Forest Service land (Poe Canyon to Kiowas Basin). Negotiations would also be pursued with the Forest Service, Bureau of Land Management, and General Services Administration to transfer administration of the 25-acre Lincoln Canyon site (site of the proposed visitor contact/interpretive facility) to the Park Service.

Alternative C would provide for increased visitor access to the Mt. Washington area, which could cause additional impacts on the bristlecone pine stand, alpine and subalpine communities, and rare and sensitive resources in the vicinity. Visitor use on the west side of the park could also adversely affect peregrine falcon habitat near the boundary. The adverse effects of domestic livestock grazing on riparian areas and water quality would be similar to those of the proposed action. In addition, grazing would continue to be

allowed in the Pine and Ridge creek drainages, which could cause adverse impacts on the Bonneville cutthroat populations; management controls would be implemented to minimize such impacts. Bonneville cutthroat populations would be expanded by reintroducing them into most east-side streams. The potential for impacts on areas with the potential for underlying caves would increase because more developments would be built on them. Most NPS operational support developments would remain in the park, and new developments would be constructed, resulting in additional impacts on vistas, particularly in and of the Lehman Cave area. Other natural and cultural resource impacts would be the same as those of the proposed action.

The impacts on grazing permittees, mineral interests, local residents and property owners, the regional economy, local and national visitors, and management and operations would be similar to those of the proposed action, except that more frontcountry services would be provided and proportionally less of the park would be set aside for primitive and backcountry experiences.

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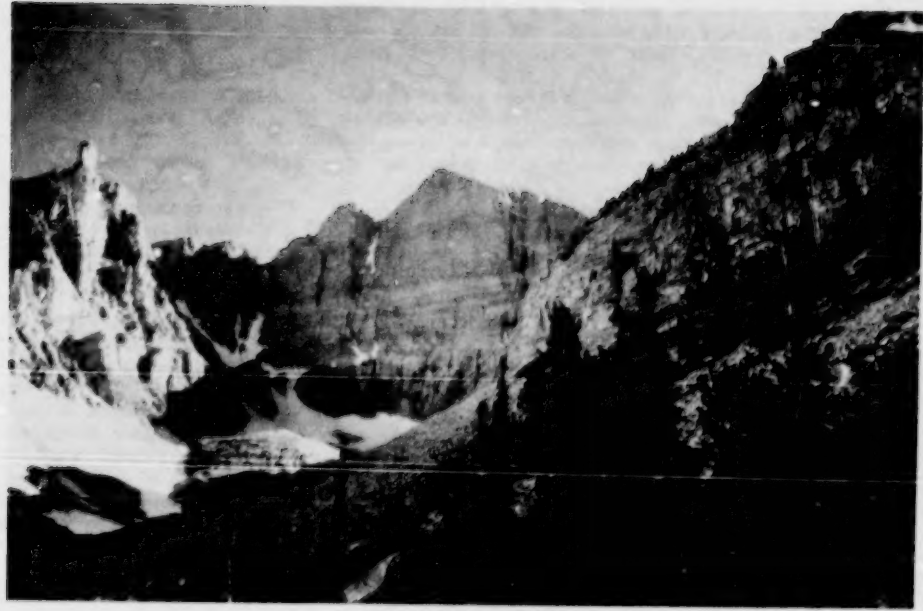
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PURPOSE OF AND NEED FOR THE PLAN

INTRODUCTION

The purpose of the general management plan for Great Basin National Park is to guide visitor use, natural and cultural resource management, and general development for the next 15 years. The plan is needed to address problems and management concerns related to visitor use (access, increased parkwide visitation, concentrations of visitors at traditional use areas, and inadequate facilities and programs to tell the Great Basin story), resource management (valid existing mining claims, continuation of congressionally authorized grazing), protection of federal and state threatened and endangered plants and animals, and preservation of important scenic, natural, geologic, and cultural resource values (including the viewshed from Wheeler Peak, the bristlecone pine forests, the Wheeler Peak cirque, and the Osceola ditch). To address these issues, the plan needs to determine what activities and actions can and cannot occur in various areas in the park.

This Draft General Management Plan/Development Concept Plans/Environmental Impact Statement presents the proposed action and three alternatives for the management of Great Basin. It also analyzes the environmental consequences of implementing them.

BRIEF DESCRIPTION OF THE PARK

The Great Basin physiographic region consists of more than 90 wide valley basins separated by some 160 long, parallel, north/south-trending mountain ranges. This basin region is immense (200,000 square miles) and includes most of Nevada, half of Utah, and portions of Oregon, Idaho, and California (see the Great Basin Region map). Defined by the peculiar fact that its few waterways drain not into the sea but into the desert flats, it is one of the least known and least visited areas in the West.

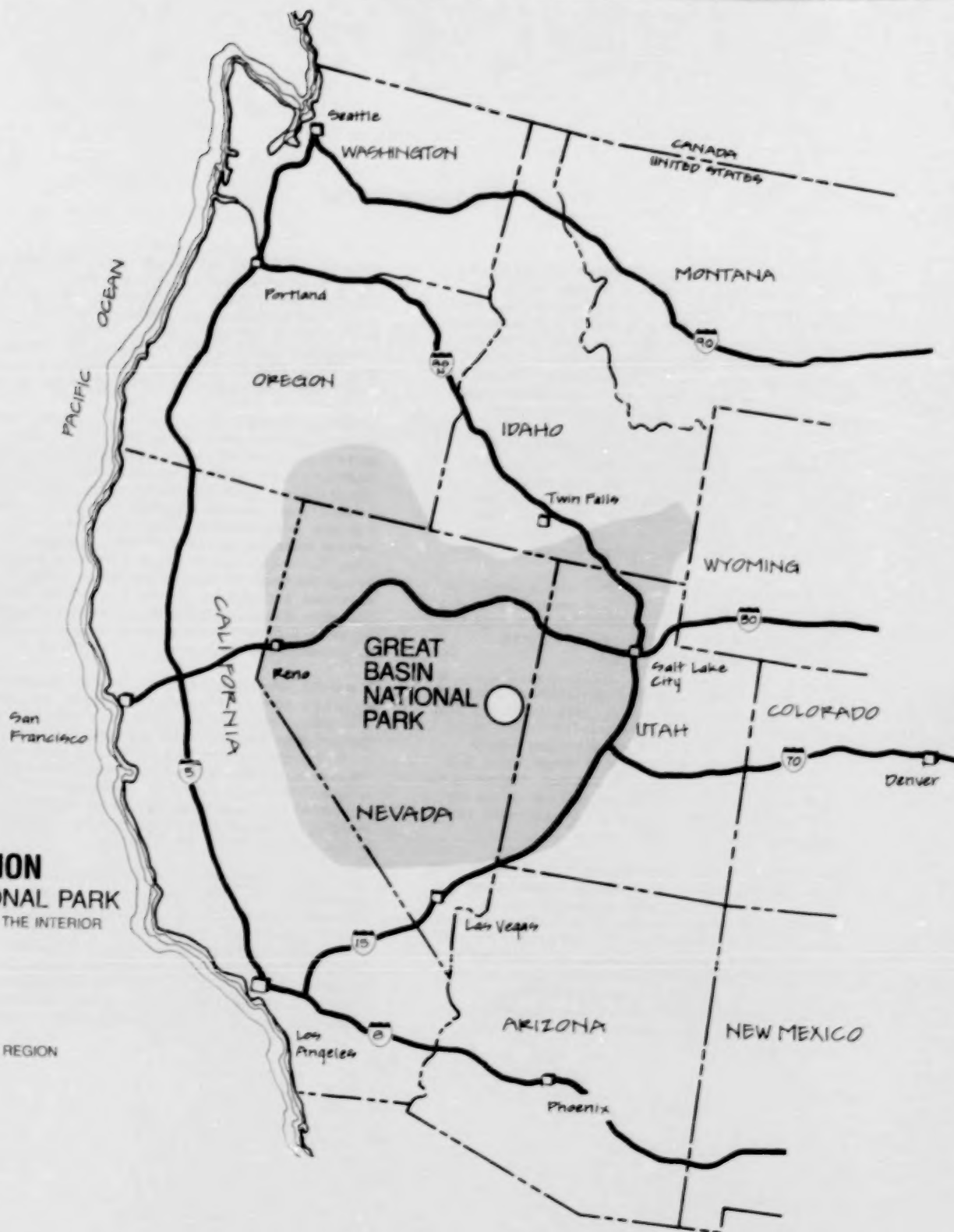
The 77,062-acre Great Basin National Park lies at the heart of this vast region in the Snake Range in east-central Nevada. The park incorporates two areas previously managed by the federal government: a 76,442-acre portion of the Humboldt National Forest (28,000 acres of this tract once constituted the Wheeler Peak Scenic Area), and the National Park Service's 640-acre Lehman Caves National Monument. This isolated mountain park overlooks two expansive basins - Spring Valley to the west and Snake Valley to the east - but it includes none of the basin environment.

The park is 300 miles north of Las Vegas, 250 miles southwest of Salt Lake City, and only a few miles south of U.S. 50, a stretch of road with widely separated services. It is 130 miles from the nearest interstate. The nearest town is Baker, a hamlet with 50 residents about 5 miles from park headquarters. Some 65 miles to the west, Ely, Nevada (population 4,900), provides major services and a regional airport. Delta, Utah (population 1,950), is 90 miles to the east.

Great Basin is dominated by 13,063-foot Wheeler Peak and its great U-shaped glacial cirque. Beneath the cirque's towering 2,000-foot walls are a glacier and rock glacier, a bristlecone forest, and three subalpine lakes. On the east side of the park, some 280 feet below the surface, is Lehman Cave - currently the park's most popular attraction. The cave, which has been a national monument since 1922, receives approximately 50,000 visitors a year (cave visitation only). Park rangers lead 90-minute tours along paved trails through the limestone caverns. The cave is artificially illuminated, and tours are given on a year-round basis. Stalactites, stalagmites, bacon strips, cave coral, shields, flowstone, and helictites are some of the unusual geological formations that contribute to the cave experience.

The visitor center next to the cave entrance provides ticket sales for cave tours, information, book sales, and a food concession. Cave tours, the visitor center orientation exhibits, film, and slide program, guided and self-guided interpretive walks, a wayside exhibit along the Wheeler Peak road, and the evening campfire programs comprise the interpretive program. From the visitor center, overlooking the historic Lehman orchard, visitors can glimpse the basin below, including a portion of Snake Valley and the Confusion Range some 40 miles in the distance.

Most administrative development, including park housing and maintenance, is near the visitor center. There are several developed campgrounds on Lehman Creek and Baker Creek within reasonable distance of the visitor center. More primitive car camping sites on Strawberry Creek and Snake Creek are popular with local and regional visitors. Campers, as well as other park visitors, frequently encounter domestic livestock during their visits because grazing is permitted in most of the park (see the "Constraints" section below).



GREAT BASIN REGION GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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■ GREAT BASIN PHYSIOGRAPHIC REGION

NO SCALE



The paved 12-mile Wheeler Peak road intersects the entrance road about 1/2 mile east of the visitor center. The road winds through several life zones, climbing from 6,600 feet near the visitor center to 10,000 feet on the flank of Wheeler Peak. From lower to higher elevations, sagebrush steppes give way to pinyon/juniper woodlands. Higher still, mahogany stands and spruce/fir and bristlecone/limber pine communities predominate. Pullouts along the road provide dramatic views of "The Great Basin." Here visitors can see for a hundred miles and grasp the expanse of the Snake Valley and the mountain ranges far to the east. One pullout provides access to the Osceola ditch - an interesting cultural remnant. This 18-mile-long ditch (10 miles of which are inside the park boundary) was built in the late 1800s and carried water from Lehman Creek to the town of Osceola where water was used in a placer mining operation.

From the small parking area and trailhead at the end of the road, visitors can hike to the Wheeler Peak cirque, the glacier and rock glacier, the bristlecone forest, and the three subalpine lakes, or they can take a more strenuous trail to the top of Wheeler Peak for a commanding 360-degree view of the Snake Range, Snake Valley, and Spring Valley.

For those hardy visitors who can hike longer distances up steep slopes, Mt. Washington in the west-central portion of the park offers an outstanding backcountry experience, and the magnificent stand of ancient bristlecone pine provides one of the park's most picturesque destination points. This forest of twisted, weather-beaten giants has endured for thousands of years, and visitors who make the effort are rewarded with a spectacular scene. The backcountry also offers opportunities to explore five life zones - from sagebrush to alpine meadow - subalpine lakes, caves, interesting geologic formations, and mining relics and paraphernalia that date from the late 1800s to the present time.

The major visitor facilities in the park today are shown on the Existing Conditions map in the "Management Zoning Concept" section.

LEGISLATIVE HISTORY

Lehman Caves National Monument was established in 1922 under the jurisdiction of the U.S. Department of Agriculture. In 1924 advocates of the park idea proposed to expand the national monument by adding Wheeler Peak and to redesignate the monument as a national park. Because of insufficient support, the idea was dropped. In 1933 Lehman Caves National Monument was transferred from the U.S. Department of Agriculture to the U.S. Department of the

Interior under the administration of the National Park Service. In 1955 another proposal was made to enlarge the national monument by including adjacent national forest land and designating the area as Great Basin National Park. At the request of Congress, in 1958 the Park Service evaluated the area and determined that it qualified for national park status. Between 1959 and 1965 several bills were introduced in an attempt to add the area to the national park system, but none were successful.

In 1973 the Park Service initiated a study to inventory and list by priority the natural features in the Great Basin with potential for nomination to the National Registry of Natural Landmarks. The study was also to recommend an area that could be added to the national park system as Great Basin National Park. In 1975 the completed landmark study suggested four potential areas: the Snake Range, Railroad Valley, Monitor Valley, and the White Mountains. In 1979, after additional consideration, a Great Basin reconnaissance survey evaluated four areas: the Snake Range/Spring Valley, Railroad Valley, Monitor/Big Smoky Valley, and White Mountains/Fish Lake Valley. The reconnaissance survey recommended that a study of alternatives be made of the Snake Range/Spring Valley area. In 1981 the Great Basin *Study of Alternatives* recommended seven alternative strategies for managing and protecting the resources in the Snake Range/Spring Valley study area. These strategies were perceived as too broad-ranging, and opposition to the national park continued. From the mid-1980s various bills were introduced to create a version of a Great Basin National Park with a variety of constraints and options. The acceptable acreage ranged between 44,000 acres and 174,000 acres. In October 1986 a last-minute compromise allowed for the creation of a 77,082-acre mountain park where there would be no hunting and no new mining claims established, but domestic livestock grazing would continue. The authorizing legislation for Great Basin National Park was signed on October 27, 1986.

Public Law 99-565 established Great Basin National Park "to preserve for the benefit and inspiration of the people a representative segment of the Great Basin of the Western United States possessing outstanding resources and significant geological and scenic values." It further stated that the Park Service is to "protect, manage and administer the park in such a manner as to conserve and protect scenery, the natural, geologic, historic and archeological resources of the park, including fish and wildlife and to provide for the public use and enjoyment of the same in such a manner as

PURPOSE OF THE PARK



Map courtesy of National Geographic

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

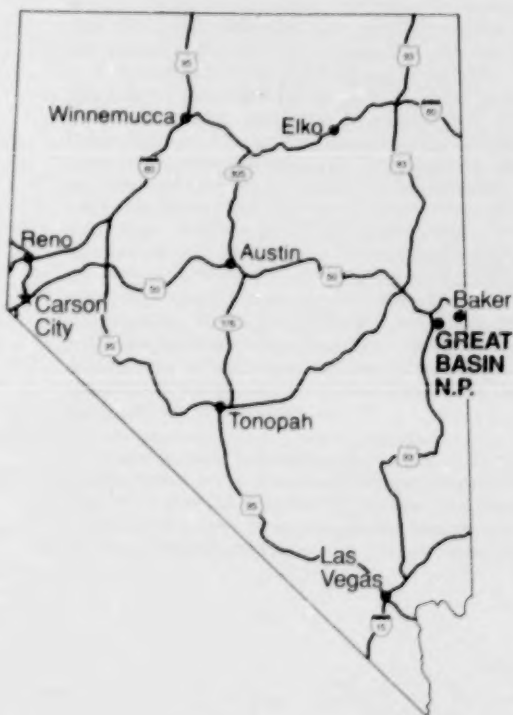
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Constraints

- ▲ DEVELOPED CAMPGROUND
- PRIMITIVE CAMPGROUND
- ☁ BRISTLECONE PINE GROVE
- PAVED HIGHWAY
- - - DIRT/GRAVEL ROAD
- TRAIL



0 2 MILES
0 3 KILOMETERS



to perpetuate these qualities for future generations." The complete text of the law is included in appendix A.

The Great Basin authorizing legislation placed the following constraints on management of the park:

CONSTRAINTS

The Secretary [of the Interior] shall permit fishing on lands and waters under his jurisdiction within the park . . . except that he may designate zones where, and periods when, no fishing may be permitted for reasons of public safety. . . .

Subject to valid existing rights, Federal lands and interests therein, within the park, are withdrawn from disposition under the public land laws and from entry or appropriation under the mining laws of the United States, from the operation of the mineral leasing laws of the United States, and from operation of the Geothermal Steam Act of 1970, as amended.

Subject to such limitations, conditions, or regulations as he may prescribe, the Secretary shall permit grazing on lands within the park to the same extent as was permitted on such lands as of July 1, 1985. Grazing within the park shall be administered by the National Park Service. . . .

Nothing in this Act shall be construed to establish a new express or implied reservation to the United States of any water or water-related right. . . . The United States shall be entitled to only that express or implied reserved water right which may have been associated with the initial establishment and withdrawal of Humboldt National Forest and the Lehman Caves National Monument. . . .

The Secretary is authorized and encouraged to enter into cooperative agreements with other Federal, State, and local public departments and agencies providing for the interpretation of the Great Basin physiographic region. Such agreements shall include . . . authority for the Secretary to develop and operate interpretive facilities and programs on lands and waters outside the boundaries of such park, with the concurrence of the owner or administrator thereof.

Other guidelines and constraints that may affect this planning effort can be found in Public Law 99-565 (see appendix A).

INTRODUCTION

PLANNING FUNCTION

PL 99-565 and its historical record give direction as to how the park is to be managed. The record is clear on which uses should be allowed and under what conditions they should be regulated or restricted. It is the function of the general management plan to identify, within these legislative parameters, reasonable use and development alternatives to ensure adequate protection of the resource values that prompted Great Basin to be included in the national park system and to provide for compatible public use and enjoyment of those resources.

In addition to the direction found in the act, the plan must be in compliance with all other applicable federal and state statutes and regulations. Consideration will be given to the protection of historic objects and archeological resources (National Historic Preservation Act and Archeological Resources Protection Act), floodplains and wetlands (Executive Orders 11988 and 11990), air and water quality (Clean Air Act and the Federal Water Pollution Control Act), and threatened/ endangered plant and animal species (Endangered Species Act).

PLANNING ISSUES AND CONCERNS

The planning issues and concerns addressed in this document were identified in meetings with concerned government agencies and the public (for additional information, see the "Consultation and Coordination" section). To a large extent, the primitive character and biological integrity of Great Basin are due to its remoteness and relative obscurity. However, with the area's recent designation as Nevada's first national park and the associated increases in visitation that can be anticipated, the impacts on Great Basin's natural and cultural resource values will likely increase. How to provide for visitor use without impairing these values or the beneficial experiences they offer is a primary planning concern. A related concern is the challenge to successfully interpret and adequately protect a basin scene when the two basins within view of the park are outside the park boundary. All of the issues and concerns related to planning for the park are described below.

INTERPRETATION Two aspects of interpretation are of concern in planning for Great Basin. First, the present interpretive emphasis inside the park is on Lehman Cave, although the creation of the park has greatly expanded the area's interpretive purpose and potential. The general management plan identifies ways to increase public understanding and appreciation of all of Great Basin's resource values within the context of its larger geographic setting. Second, examination of the 1981 Great Basin *Study of Alternatives* shows that the landforms and ecosystems within the established national park boundary do not fully represent the physiographic theme that is central to the Great Basin story. For that reason, PL 99-565 encouraged the Park Service to enter into cooperative agreements with other agencies in the region to develop interpretive facilities and programs on lands outside the park boundary that will ensure full interpretation of this physiographic region. The general management plan includes proposals for interpreting Great Basin National Park in areas administered by other agencies and for initiating a cooperative interagency interpretive plan for the region's many and varied resources.

PARK DEVELOPMENT A number of facilities are already in place in Great Basin to support visitor use at Lehman Cave, and these facilities can form the nucleus of services for the new park. Included in a single building are a food and gift concession, an orientation center/publication sales area, a ticket sales area for the cave

tour, and park offices. A 30-site picnic area and restrooms are a short distance from the administration building. The developed area also includes a potable water treatment and storage system, a sewage treatment facility, park housing, and a maintenance facility. The lands transferred from the U.S. Forest Service include four developed campgrounds, with a total of 104 sites and restroom facilities, and two primitive campgrounds. Although these facilities were adequate to serve the needs of visitors to the national monument, the expanded Park Service responsibilities associated with managing a 77,082-acre park and the potential for substantially increased visitation will require additional development. The general management plan assesses changing needs and includes cost-effective and resource-sensitive proposals for future development.

In 1989 a draft backcountry trails study was prepared for the existing 61 miles of trails in the park. In general, most of the trails are in fair to poor condition, requiring rehabilitation and in some cases relocation. Common problems are excessive grades, unstable treads and backslopes, and loose rock; safety hazards associated with these conditions; inadequate water diversion; berm buildup along the edges of trails that causes water to course and accelerate erosion on the trails; common use of trail sections by cattle and park visitors; and inadequate signing. Based on the recommendations in the trails plan, the general management plan proposes maintenance, rehabilitation, reconstruction, and new construction to provide an upgraded and integrated trail system in the park.

Visitors currently approach the park along a state road that passes through the center of Baker and then through a small housing subdivision before crossing the park boundary. The existing approach does not provide an appropriate setting for entering the park, and there is potential for additional commercial development along it. Improved park access is a major component of the general management plan.

ACCESS

Most of the area that is now Great Basin National Park was previously managed for multiple use, and numerous paved, gravel, and dirt roads provide access. The 20+ entry points and all existing roads (both surfaced and unsurfaced) need to be evaluated to determine which of them are needed for park purposes. Because 93 percent of the park is

PLANNING ISSUES AND CONCERNS

surrounded by other federal lands, close cooperation will be required among all managing agencies to ensure proper coordination of access in and around the park. Existing powerline, pipeline, and other special use rights-of-way also need to be assessed to ensure that important or sensitive resource areas within the park are adequately protected. The general management plan includes these evaluations and recommends actions to provide for park access and circulation.

SCENIC RESOURCES

The views across Snake Valley and Spring Valley as visitors approach the park and from various locations within the park greatly enhance experiences and are a significant park resource. Although these valleys are not within the park boundary, they are critical in conveying the theme of "the Great Basin physiographic region" to visitors. Without the contrasting valley basins, the mountainous lands inside the park can illustrate only a portion of that theme. The loss or visual impairment of these basins as a result of major industrial, commercial, or military activity would alter the pastoral basin scene that adds a critical dimension to the national park. The general management plan includes recommendations for preserving scenic resources within the Great Basin region.

GRAZING

PL 99-565 authorizes domestic livestock grazing within the park boundary and directs the Park Service to administer this activity. There are seven grazing allotments and five permittees in the park. Improvements on the allotments include cattle guards, fencing, troughs, pipelines, and water tanks. Most of the individual allotments involve Forest Service lands as well as lands within the park; one involves Bureau of Land Management as well as park lands. In these cases different regulations apply for different parts of the same allotment, which can confuse and burden the permittee.

A number of concerns need to be considered in the management of grazing within the park. The present level of grazing in specific locations may be damaging vegetation beyond the point of recovery. Grazing in sensitive resource areas at higher elevations (subalpine meadows and tundra) may be particularly damaging because of the slower regenerative powers of high elevation landscapes. Erosion associated with overgrazing may be affecting the water quality of streams and lakes. Disease and competition for pasture are continuing concerns in managing both domestic livestock and native wildlife. Finally, as public use increases, there is the potential for conflicts both real and perceived between livestock and park visitors. The plan addresses these concerns and includes general proposals to reduce the

effect of grazing on the park environment and the potential conflicts between visitors and livestock.

During early scoping and public involvement efforts for the Great Basin general management plan, concerns were expressed about the continuation of livestock grazing in the park. More than 200 unsolicited write-in responses were received to the 1988 *Alternatives Workbook* stating that grazing is incompatible with the purpose of the park and should be eliminated (see the "Consultation and Coordination" section for details). The authorizing legislation for the park provides for the continuation of grazing subject to such limitations, conditions, or regulations as the secretary of the interior may prescribe. The plan recommends that actions be taken to ensure sound rangeland management, to protect sensitive natural features, and to provide strategies that will minimize conflicts between grazing and public use.

PL 99-565 provided that the existing reserved water rights in Humboldt National Forest (only that portion included in the new park) and Lehman Caves National Monument be transferred to Great Basin National Park. However, it excluded the creation of new federal reserved water rights for national park purposes.

WATER RIGHTS

To ensure adequate environmental conditions for wildlife and to perpetuate a natural ecological system, water requirements for Great Basin National Park may prove to be much greater than that which can be provided through the exercise of reserved water rights. If additional water is required, the Park Service will need to develop strategies to obtain more water (in accordance with the substantive and procedural law of the state of Nevada) or alter the park's management objectives to "make do" with the existing water rights allocation (by storing more of the water provided within existing rights, for example).

The South Snake Range has high potential for mineral occurrence. There are seven mining districts and a limestone quarry in the South Snake Range. Tungsten and gold have historically been the highest yielding commodities, while lesser amounts of silver, lead, zinc, and copper have been extracted. Beryllium and fluor spar are other prospective mineral resources within the park. The enabling legislation for Great Basin National Park specifically prohibits mineral leasing within the park boundary. Additionally, Congress has closed the park to mineral entry (mining claim location) subject to valid existing rights. This means that holders of valid claims have the right (assuming an approved plan of operation) to develop the minerals associated with these

MINING

claims. Although historically there has been mining activity within the boundary, there are currently no active mining operations in the park. Some of the claim groups have, however, had assessment work or exploration activities as recently as 1986.

There are no patented mining claims within the park boundary. Unpatented claims number 247. The Park Service is in the process of examining the validity of all of these claims. The claims occur in six claim groups; five are in the immediate vicinity of Mt. Washington on the west side of the park. At present it is not known how many of the unpatented claims will be found to be valid. The management zoning proposal in the general management plan (along with other relevant documents and information) provides an appropriate level of protection for natural, cultural, and scenic resources and will be used as a basis for evaluating any future mining plans of operation that may be submitted by owners of valid claims.

Active mining operations have occurred as recently as the 1970s adjacent to but outside the park boundary near Mt. Washington. The bristlecone pine forest atop Mt. Washington is one of the park's most important and fragile resources. The potential impact of mining activities on park resources is a prime planning concern.

BOUNDARY ADJUSTMENTS

Approximately 93 percent of the Great Basin National Park boundary abuts other federal lands (78 percent Forest Service, 15 percent Bureau of Land Management). This planning effort does not address major boundary adjustments; however, minor boundary modifications are recommended between federal agencies where such modifications will facilitate more efficient management of federal lands.

FISH AND WILDLIFE MANAGEMENT

When a portion of the area that is now Great Basin National Park was under Forest Service management, hunting and fishing were major recreational activities. With the passage of PL 99-565, hunting was prohibited within the park boundary. Fishing, specifically authorized in the park legislation, occurs in several major streams and lakes in the park. The Nevada Department of Wildlife is responsible for fish stocking and in the past stocked streams and lakes in the park with a variety of nonnative fish species. Park Service management policies do not allow for stocking of nonnative fish in areas designated as "natural" zones, but they do permit stocking in areas identified as "special use" zones. The general management plan, which is the primary vehicle for establishing zones within Great Basin National

Park, includes a determination of whether fish stocking is appropriate and if so where it should occur.

The Bonneville cutthroat trout is the only native trout in the streams of the park; it once inhabited all of the major streams on the park's eastern side. Because these streams have been disturbed by human actions, pure strains of Bonneville cutthroat trout no longer exist in the park's historic range. On the west side of the park, at least two streams outside the historic range of the Bonneville cutthroat trout contain introduced pure-strain populations of the trout. It may be possible to reestablish Bonneville cutthroat trout in the east side streams if the factors that contributed to their elimination from those streams are eliminated or mitigated by some means. The general management plan addresses the reintroduction of the trout.

The general management plan establishes broad objectives for wildlife management, taking into consideration related park issues. A resource management action plan is being prepared concurrently with the general management plan and will be finalized after the general management plan is approved. That plan will provide recommendations for wildlife management as well as other natural and cultural resource concerns.

The park contains potential habitat for bald eagles and peregrine falcons, both listed as endangered under the Endangered Species Act. The park is also home to several candidate species, including the ferruginous hawk, Bonneville cutthroat trout, and at least four alpine plant species. The plan recommends cooperative activities for reintroducing some of the species into their historic ranges and developing methods to protect them and their habitats.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES

In addition to the significant cave resources within Lehman Cave, caves are found in limestone outcroppings throughout the park. Many of these resources are extremely fragile, highly susceptible to vandalism, and at best only partially known. The general management plan addresses several concerns related to caves, including proper management of cave resources to ensure visitor safety, protection of wild caves from vandalism, and provision of access to caves that can accommodate visitor use without deterioration. Issues concerning the use and management of Lehman Cave are also addressed, including appropriate visitor use levels.

CAVE MANAGEMENT

Although visitor use within the park will most likely continue to focus on Lehman Cave and the resources along the Wheeler Peak scenic road, there is also potential for

BACKCOUNTRY MANAGEMENT

PLANNING ISSUES AND CONCERNS

increased use of the park's backcountry. Numerous trails and unmaintained roads provide access to large portions of the park. The general management plan identifies the appropriate types and levels of backcountry use and the primary backcountry trail corridors and access points that will be available for future use.

SPECIAL USES

The Park Service mandate requires that the agency regulate the use of parks so that their resources are perpetuated for enjoyment by future generations. Thus, the types of allowable uses are limited by requirements of resource management and protection, and consumptive uses are not permitted. Because most of the area that is now Great Basin National Park was previously managed as a multiple use area where consumptive uses of resources were allowed, traditional resource uses and visitor activities as well as potential future uses have been evaluated to determine if they are compatible with national park management concepts. The general management plan includes recommendations concerning hang gliding, snowmobiling, cross-country skiing, mountain bicycling, horseback riding, hiking, spelunking, and research under permit.

party incursions, and most notably the development of mining and ranching. Of the many representative resources, the Lehman orchard and aqueduct and the Rhodes cabin are listed on the National Register of Historic Places as having local significance. A *Historic Resource Study* (NPS, Unrau 1990c) has been completed in concert with the general management plan. It identifies actions needed for the protection, management, and interpretation of historic resources within the park. These actions are summarized in the plan.

There is a Western Shoshone colony in nearby Ely, Nevada, and some descendants of the original inhabitants of the area may live on the Goshute Reservation to the north or on the Duckwater Reservation to the west. Traditional pine nut gathering areas are still in use in the vicinity. Native American groups will be consulted concerning the identification of important cultural sites in the park and the development of a park ethnographic program. An ethnographic overview and assessment will be prepared for the park.

NATIVE AMERICAN RELATIONSHIPS

ARCHEOLOGY

Three studies of the park's archeological resources have been completed to support and guide general management planning: *Archeological Overview of Great Basin National Park* (NPS, Deal 1988a), *Archeological Survey and Site Assessment at Great Basin National Park* (NPS, Wells 1990a), and *Archeological Survey of the Baker Guard Station* (NPS, Teague 1990b). These studies are described briefly in the "Related Issues and Concerns" section.

Radiocarbon dates fix the earliest known occupation of the area within the park boundary at 11,000 to 10,000 B.P. Archeological surveys have been conducted on less than 2 percent of the newly added park lands. This limited research indicates that the frequency of sites in the park is slightly higher than in adjacent areas. There are a variety of site types within the Snake Range. Prehistoric types include caves and rock shelters (some with stratified living floors); burial grounds and burial caves; spring sites; open sites that contain lithic and artifact scatters, potsherds, hearths, or rock circles; pueblos; pictographs and petroglyphs; and hunting blinds and hunting corrals. Historic sites of archeological value include mines and mining-related sites. The general management plan provides direction for identifying and managing historic and prehistoric archeological sites.

All proposed actions require interaction with and assistance from other federal, state, and local agencies if the Park Service is to be successful in implementing the plan. For example, Forest Service cooperation and assistance will be critical because most of the lands surrounding the park are administered by the Forest Service. Similarly, BLM lands are important in protecting the Snake Valley and Spring Valley viewsheds that are critical to the visitor experience at Great Basin National Park. The state will play an important role in the evaluation and determination of water rights, and the county will be instrumental in the development of tourism. The plan recognizes the importance of interagency cooperation in planning for the park and region, and it includes specific recommendations for cooperative activities.

INTERAGENCY COOPERATION

When the final general management plan is approved, it will establish the guiding management philosophy for Great Basin National Park and will provide strategies for addressing issues and achieving management objectives for the next 15 years. Based on those strategies, more detailed implementing plans, or action plans, will be developed to carry out plan concepts and identify necessary developments and specific actions for efficient protection, use, and operations. A resource management plan, a rangeland analysis, and grazing allotment management plans are being prepared concurrently with this draft general management plan, and interpretive proposals are included in the general management plan. Other action plans will include a fire

RELATED ISSUES AND CONCERNS

Relationship of the General Management Plan to Other NPS Planning Efforts and Management Actions

HISTORIC SITES

Historic resources of the park reflect settlement attempts and crossings of the area by Mormon pioneers, Army survey

management plan, cave management plan, water resources plan, backcountry management plan, and land protection plan.

A number of studies have been prepared concurrently with the general management plan to provide research and other support information for planning.

The 1990 Great Basin *Historic Resource Study*, prepared by the Park Service's Denver Service Center, provides research data on historic events in and near the park and identifies historic resources associated with those events. The study has been used by the planning team to formulate actions to preserve, protect, and interpret the park's historic resources.

The Park Service's Western Archeological and Conservation Center has prepared three reports on archeological resources in the park and region. The *Archeological Overview of Great Basin National Park* presents an overview of regional archeology and cultural resources along with procedural guidelines for their preservation and protection. The *Archeological Survey and Site Assessment at Great Basin National Park* documents the findings of a preliminary survey of archeological resources in the park. The *Archeological Survey of the Baker Guard Station* documents the results of an archeological survey of that property.

A Great Basin visitor survey conducted in 1988 by the Park Service's Cooperative Park Studies Unit and the Department of Forest Resources at Oregon State University has generated information about park visitors for managers and planners and provided baseline data for monitoring the impacts of the park's creation and subsequent changes in visitation over time. This data has been used in the preparation of the draft general management plan.

A Great Basin economic study is currently being prepared under contract. This study is using Great Basin National Park as a prototype in developing a methodology for measuring and predicting the economic impacts of national park units on local and regional economies. A related aspect of the study is determining the effects that different Park Service actions (for example, park establishment and general management planning) have on park visitation and surrounding economies. Research at Great Basin will establish baseline data, predict impacts, and measure actual economic impacts over time. Subject to funding, the draft methodology will be applied in other national park units to perfect its use as a tool for determining such impacts. If successful, it may become a standard methodology for

analyzing economic impacts throughout the national park system.

A Great Basin water and sewer study is being prepared to evaluate the condition of the existing water and sewer system and associated facilities. The study, which is being completed by a private contractor, will identify and evaluate alternatives for providing the park with adequate water and sewer service, including options that would allow the Park Service and the community of Baker to share water and sewer services.

Other plans that are being prepared include an interim grazing management plan, a geographical information system plan, a water resources management plan, and an abandoned mine land survey.

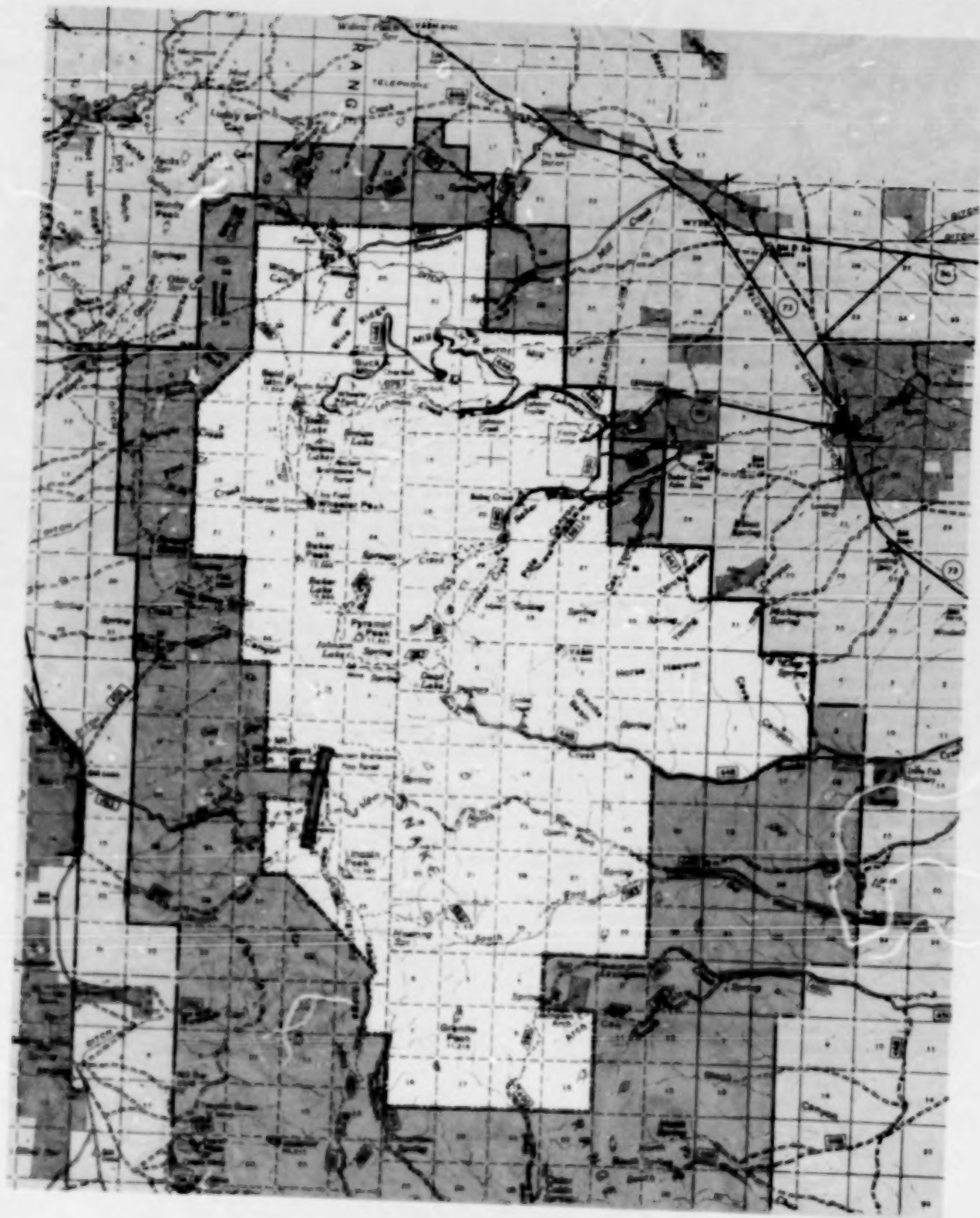
The state of Nevada is taking the lead in developing a Baker town plan. This plan will address a wide range of community needs and will aid the town of Baker in preparing for changes associated with the establishment of Great Basin National Park. White Pine County, the Baker Town Board, and, if requested, the Park Service will provide assistance to the state.

Relationship
of the Plan to
Other Federal,
State, and
Private
Organizations
and Programs

The Humboldt National Forest 1985 *Land and Resources Management Plan* and the Bureau of Land Management 1984 *Schell Resources Area Management Framework Plan* are in place and currently guide the management of other federal lands adjacent to the park (see the Land Status map). The Park Service formally consulted with both federal agencies before developing the draft plan and alternatives in this document.

The *State Comprehensive Outdoor Recreation Plan* was prepared by the Nevada Department of Conservation and Natural Resources, State Parks Division, in 1987 to guide the development of recreational opportunities in Nevada. It states:

The recreational, historical, cultural and natural resources of the State of Nevada that are significant need further protection. Some of the multiple uses that occur on public domain have in many cases destroyed the significant resources of the state. Without some sort of protection, many other resources could be lost.



LAND STATUS

GREAT BASIN NATIONAL PARK VICINITY

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Issues Beyond the Scope of the General Management Plan

- ☐ NATIONAL PARK SERVICE
- ☐ UNITED STATES FOREST SERVICE
- ☐ BUREAU OF LAND MANAGEMENT
- ☐ PRIVATE



0 9,000 FEET

Following is a SCORP list of favorite recreational activities and needs for regional planning and development district IV, which includes Lincoln County, Eureka County, White Pine County, and Great Basin National Park (see the State Planning Regions and Counties map):

Favorite Activities (in priority)

- lake fishing*
- game hunting
- hiking/walking*
- pleasure driving*
- horseback riding*

Recreational Needs

(activities where demand exceeds supply)

- stream fishing*
- cross-country skiing*
- tennis

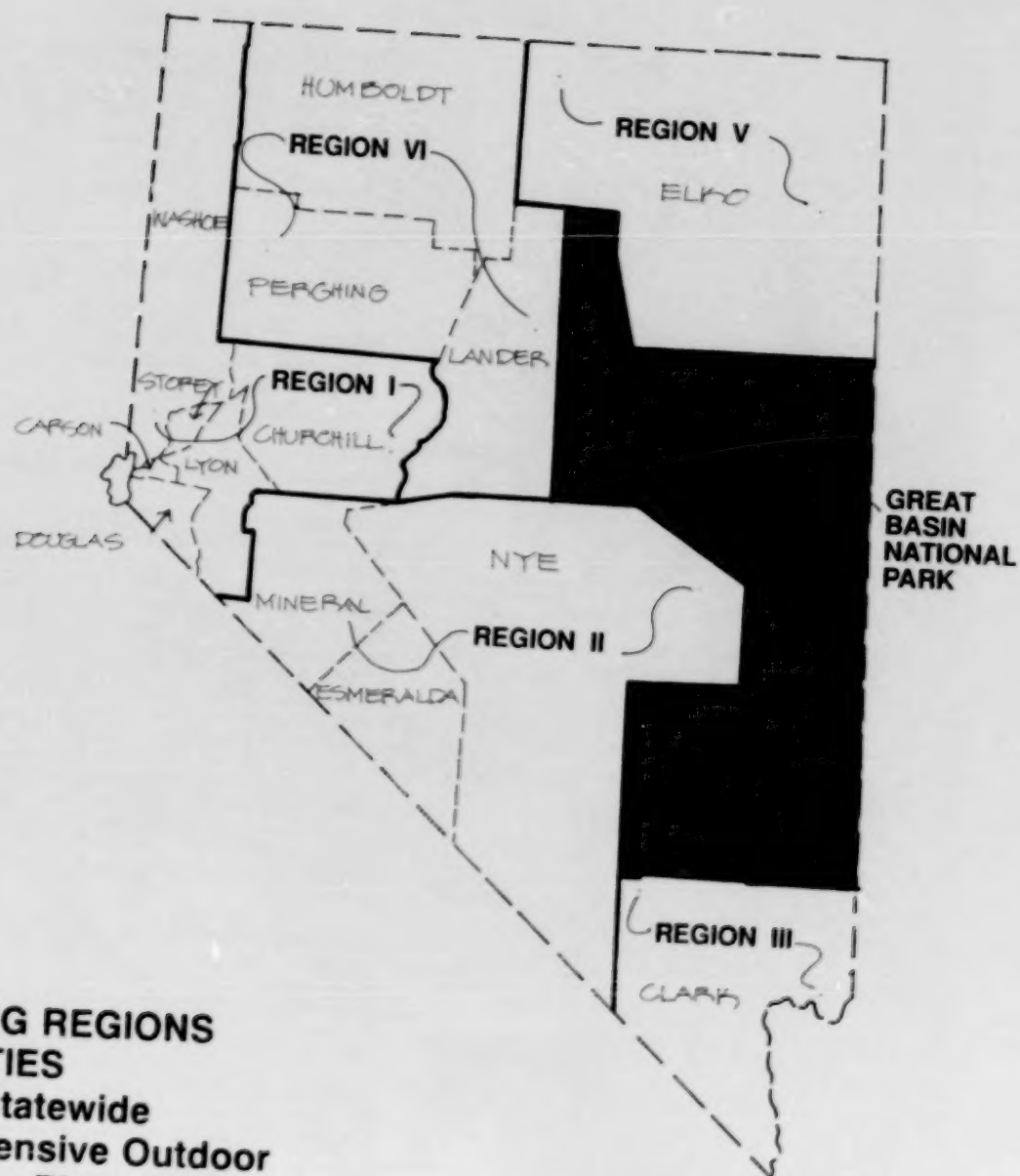
*Activities provided at Great Basin National Park

The recreational interests and needs identified in the state plan have been considered during the development of the general management plan.

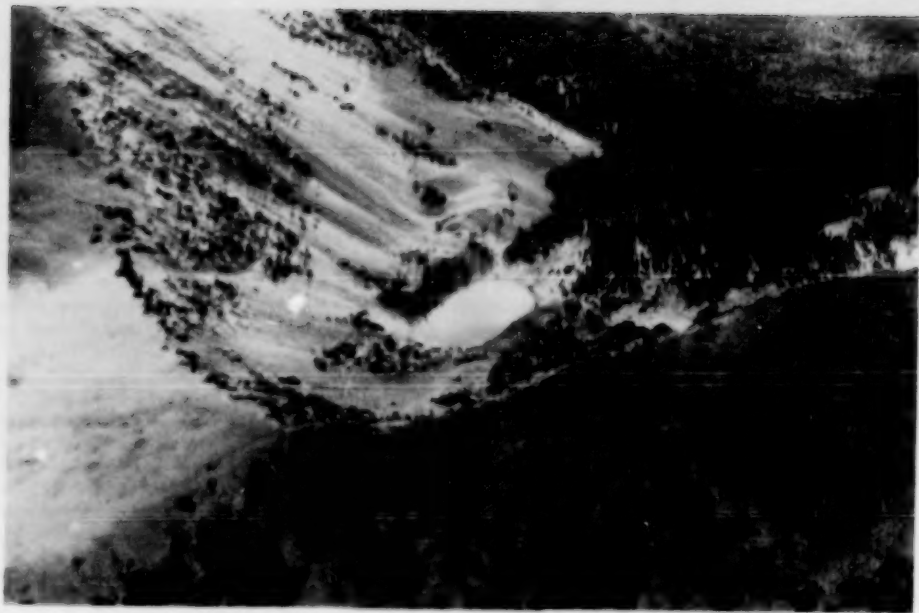
Wilderness recommendation was determined to be beyond the scope of the general management plan. When the 28,000-acre Wheeler Peak Scenic Area was part of Humboldt National Forest, the Forest Service reviewed the area and proposed it for future wilderness evaluation. The general management plan for Great Basin does not include a wilderness recommendation. However, the planning team has evaluated the lands within the park and produced a map showing the lands that meet or potentially meet the criteria for wilderness under the Wilderness Act. If the Park Service decides to make a wilderness recommendation in the future, this map can be used to provide necessary background information. The map is included in this document as appendix B.

ISSUES
BEYOND THE
SCOPE OF
THE GENERAL
MANAGEMENT
PLAN

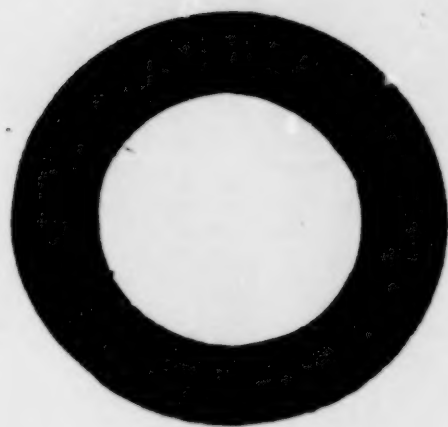
Other issues and concerns that were raised during the public involvement process were considered beyond the scope of this general management plan or were inappropriate given the legislative mandate for the park. Suggestions included eliminating Great Basin National Park, doubling or tripling its size, allowing hunting, and eliminating grazing. Many suggestions have been passed on to field managers for their consideration, but they have not been considered in this plan. The "Consultation and Coordination" section contains a discussion of public issues, concerns, and suggestions.



**PLANNING REGIONS
& COUNTIES**
Nevada Statewide
Comprehensive Outdoor
Recreation Plan, 1987



ALTERNATIVES INCLUDING THE PROPOSED ACTION



PLANNING PERSPECTIVE

The Great Basin National Park authorizing legislation (PL 99-565) and the National Park Service *Management Policies* (NPS 1989a) provided primary direction for park planning. In addition, exceptional resources were identified, planning objectives were established, and a management zoning concept was developed to guide the formulation of the proposed action and the alternatives. The exceptional resources and planning objectives identified by the planning team are described below. The management zoning concept is detailed in the "Actions Common to All Alternatives" section.

EXCEPTIONAL RESOURCES

The exceptional natural and cultural resources and unique biological attributes of the park were identified, inventoried, analyzed, and where possible mapped using the following criteria:

outstanding examples of the natural, scenic, geological, ecological, floral, faunal, and recreational values for which the park was established

populations of rare plants and animals that are particularly vulnerable because of their small population sizes and genetic isolation

habitat necessary for the survival or reintroduction of federal- or state-recognized threatened or endangered species or candidate species being considered for listing

resources that are unusually sensitive to human use

major archeological or important historical resources

The following resources and attributes were given particular attention during planning. They are illustrated on the Exceptional Resources maps.

Bristlecone Pine Forests

Bristlecone pines grow at high elevations (generally between 9,000 and 12,000 feet) in the Sierras, the mountains of the southern Rocky Mountains, and the ranges of the Great Basin. Although fairly common along the ridgetops where they grow, most stands are relatively inaccessible. Great Basin National Park contains several bristlecone pine stands - the most exceptional examples of this species in the national park system. Most of these stands are near ridgetops on limestone soils at elevations above 10,000 feet.

Bristlecone pines are the oldest trees in North America and are capable of growing in some of the harshest environments on the continent. Some of the stands in the park contain very ancient trees (in excess of 4,500 years) and represent an unparalleled scenic attraction and a valuable scientific resource. The world's oldest known bristlecone pine was discovered in a stand near Wheeler Peak in 1967. It was estimated to be over 4,900 years old.

In addition to living bristlecones, the Mt. Washington area of the park contains stands of dead standing and fallen bristlecones with no large living trees and little evidence of reproduction. These trees are also a valuable scientific resource for evaluating past climatic changes and the way plants respond to those changes.

Because of the relative scarcity of water in the South Snake Range, riparian areas represent a very small percentage of the park. However, these areas have great ecological significance because they support a greater quantity and diversity of species than the adjoining more arid land.

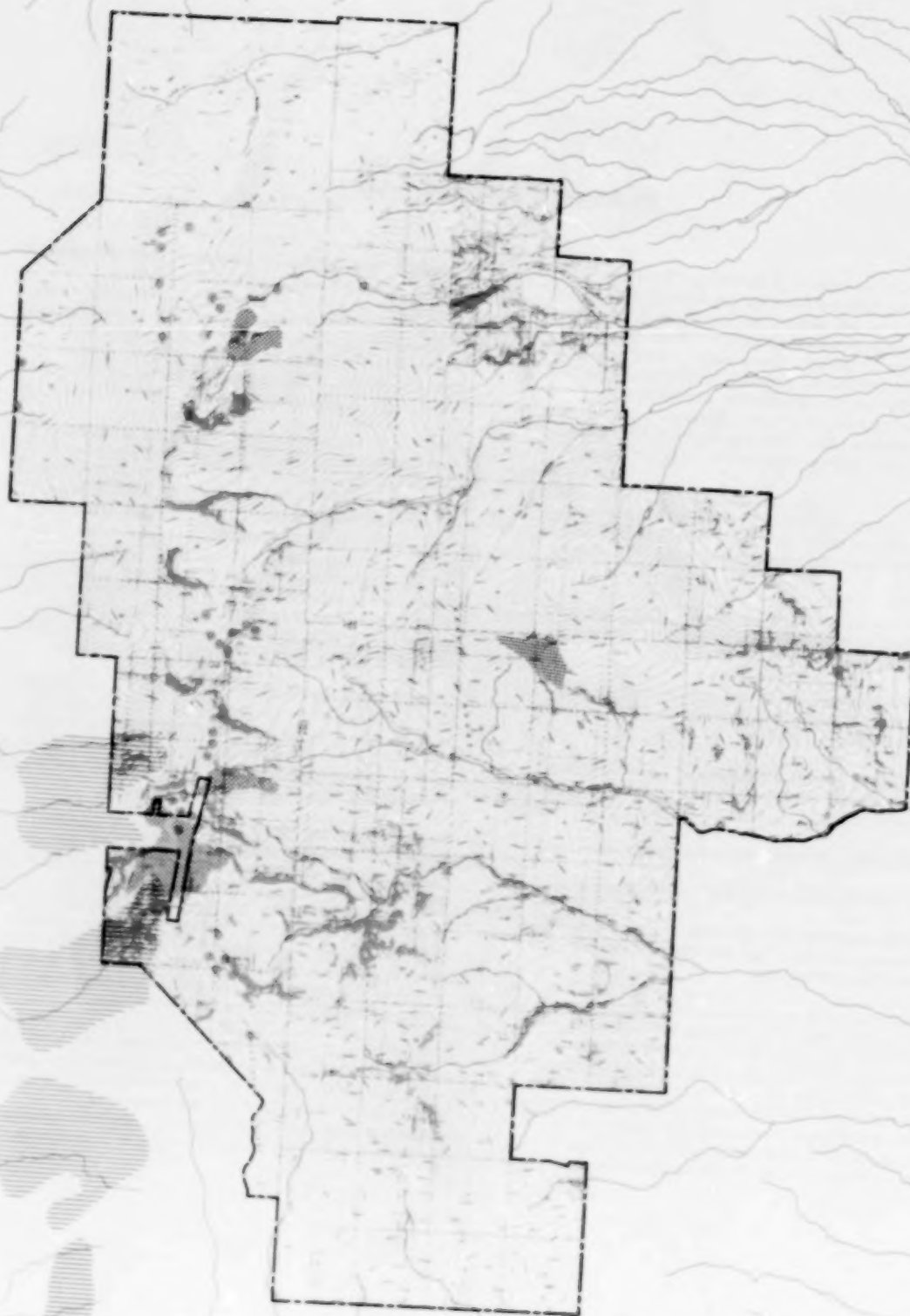
Riparian
Areas and
Water
Quality

The biological productivity of riparian areas is substantially higher than that of surrounding areas. They provide food, water, shade, and cover for fish and wildlife. They remove sediment from the water flowing through them and shade the streams, thus cooling the water. Many life forms in the park are dependent upon these areas.

Water quality in the South Snake Range is a planning concern because high elevation (above 10,000 feet) lakes and streams contain exceptionally pure water and because livestock grazing in the lower portions of the park's drainages may be adversely affecting water quality in riparian areas. Several high elevation lakes and streams contain water with exceptionally low quantities of soluble minerals and very low buffering capacities. These streams and lakes are extremely vulnerable to acid deposition resulting from rain, snow, fog, and dry fallout.

The park contains more than 20,000 acres over 10,000 feet in elevation. At these high elevations, environmental stress on resident plant species is at its extreme. The geologic history of the Great Basin and the isolation of alpine/subalpine areas from other high elevation mountainous areas have combined to produce endemic plant species.

Alpine/
Subalpine
Areas



EXCEPTIONAL RESOURCES – BIOLOGICAL

GREAT BASIN NATIONAL PARK

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Exceptional Resources

-  BRISTLECONE PINE
-  PEREGRINE FALCON POTENTIAL NESTING HABITAT
-  FEDERAL AND STATE-LISTED THREATENED, ENDANGERED, PROTECTED, AND SENSITIVE PLANT AND ANIMAL SPECIES
-  RIPARIAN AREAS



0 2 MILES
0 3 KILOMETERS

subspecies, and varieties that exist nowhere else. The majority of the park's known rare plant species are found in these areas. Alpine/subalpine areas are extremely sensitive to human disturbance and, once disturbed, very slow to recover.

Several endangered, sensitive, and candidate species were identified in cooperation with the U.S. Fish and Wildlife Service, the Nevada Natural Heritage Program, and Nevada Department of Wildlife as inhabiting the park. Two species on the federal endangered species list are known or suspected to occur in the park; nine others are candidate species for listing. The park also contains two species that are listed on the Nevada Natural Heritage Program list as endangered, protected, or sensitive (see table 1).

Federal- and
State-listed
Threatened,
Endangered,
Protected, and
Sensitive Plant
and Animal
Species

Of the species listed in table 1, the following are considered critical to this planning effort.

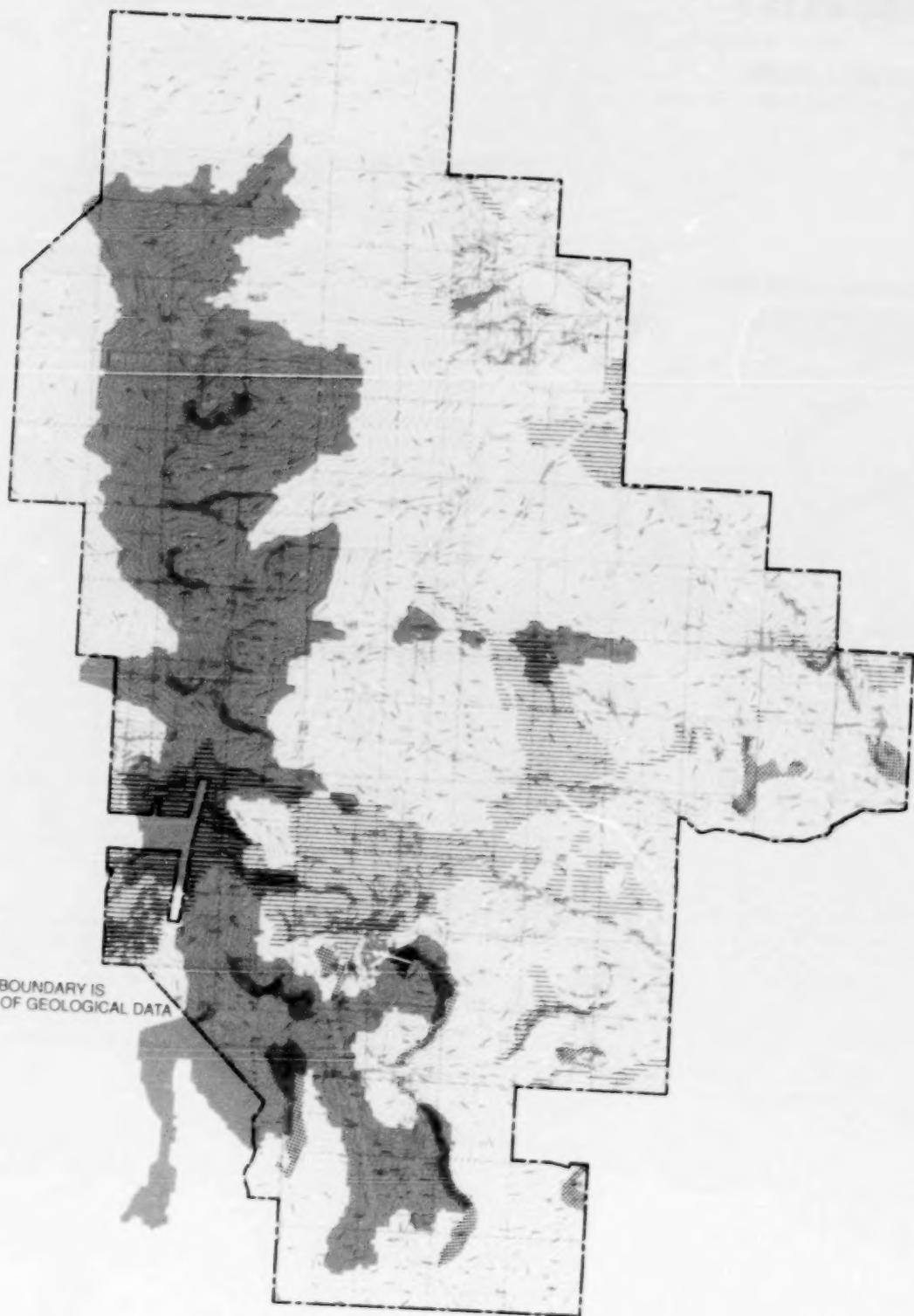
Sensitive Plant Species. All of the plant species listed in table 1 are considered important in planning because of the potential for domestic livestock grazing, mining, and recreational uses in the park to affect these species and their habitats.

Bonneville cutthroat trout. At the present time, only 15 wild populations of Bonneville cutthroat trout are known to exist, and one of these populations is in the park. Genetically pure populations of this fish are very rare because of habitat loss and the introduction of competitive and hybridizing salmonid species.

Planning for the Bonneville cutthroat is important because of its value as a genetic resource and because of the susceptibility of this isolated population to random events such as flooding or drought. In addition, the Park Service has an opportunity to reintroduce it into at least part of its historic range in the park.

Peregrine falcon. Planning for the endangered peregrine falcon is important because there is excellent potential nesting habitat in the southern and western sections of the park. Interagency recovery efforts are underway to reestablish peregrines in the South Snake Range, and the Park Service can contribute to these efforts. A portion of the park has already been designated as a part of the recovery area.

PARK BOUNDARY IS
EDGE OF GEOLOGICAL DATA



EXCEPTIONAL RESOURCES – PHYSICAL

GREAT BASIN NATIONAL PARK

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-  POLE CANYON LIMESTONE
-  NOTCH PEAK LIMESTONE
-  ALPINE/SUBALPINE AREAS (OVER 10,000')



0 2 MILES
0 3 KILOMETERS

Exceptional Resources

Table 1: Endangered, Sensitive, Protected, and Candidate Species Known or Suspected to Use Habitat in Great Basin National Park

	Federal Status	State Status
Plants		
Snow wavewing, <i>Cymopterus nivalis</i>	C	–
Intermountain wavewing, <i>Cymopterus basalticus</i> *	C	–
Holmgren's buckwheat, <i>Eriogonum holmgrenii</i>	C	–
Tunnel springs beardtongue, <i>Penstemon concinnus</i>	C	–
Nevada primrose, <i>Primula nevadensis</i>	C	–
Nachlinger's catchfly, <i>Silene nachlingerae</i> ***	–	–
Pennell's penstemon, <i>Penstemon francisci-pennellii</i>	C	–
Birds		
Bald eagle, <i>Haliaeetus leucocephalus</i> **	E	E
Peregrine falcon, <i>Falco peregrinus</i>	E	E
Ferruginous hawk, <i>Buteo regalis</i> *	C	P
Swainson's hawk, <i>Buteo swainsoni</i> *	C	P
Mammals		
Spotted bat, <i>Euderma maculatum</i> *	C	P
Fish		
Bonneville cutthroat trout, <i>Oncorhynchus clarki utah</i>	C	S
Insects		
Korei's checkerspot, <i>Euphydryas editha korei</i> ***	–	–

Codes: E = Endangered
S = Sensitive
P = Protected (under Nevada law)
C = Candidate

* Not known to be present but habitat is suitable

** Transient through the park

***Species recommended for state listing by Nevada Natural Heritage Program

(A more detailed description of these species is found in the "Affected Environment" section.)

**Biological
Diversity**

Because of the elevation, temperature, and moisture gradients in the South Snake Range, one of the park's most notable attributes is its great diversity of biological communities. These communities, ranging from desert to alpine, provide a wide range of habitats for animal species and a valuable laboratory for understanding and evaluating how plants and animals respond to environmental change. Although most of the park's biological communities are characteristic of high Great Basin ranges, nowhere else is the distribution of these communities more dramatically displayed. Many communities in the park are small, isolated, and occupy unique habitats with a specific combination of climatic, geologic, topographic, and other environmental factors. In addition, many species in the park are at the extreme ends of their natural ranges.

Because of the isolation of the South Snake Range from other temperate mountain ranges and the harshness of the surrounding desert environment, many plant and animal populations have evolved in isolation from other populations into unique endemic forms. The genetic significance of many of these populations and the interrelationships and habitat requirements of many of the unique species are poorly understood because they have not been fully studied.

Caves

Great Basin has numerous limestone outcrops, many of which contain natural caverns. Lehman Cave is only one of about 30 known caverns in the park. Many have not been explored, and many more undoubtedly exist. Because of the general lack of knowledge about the location of caves in the park, all areas with the potential for underlying solution caves are considered sensitive areas.

**Glacial
Features**

Glacial formations in the park include cirques, tarns, a remnant glacier, and a rock glacier. These features are important because few other mountain ranges within the Great Basin physiographic region contain glacial features that are as well defined. The park's glacial features are also important in interpretation because they provide visual evidence of the dramatic climate change during the Pleistocene epoch that so strongly influenced the present biotic communities and landforms of the park and the Great Basin region.

Air Quality

The area of eastern Nevada that includes the park has air quality exceeding the highest standard in the United States. Visibility from the park often exceeds 120 miles. The ability to view broad areas of basin and range topography and distant mountains is central to interpreting the entire Great Basin region, one of the park mandates established by

Congress. In addition, because of the superior air quality and the area's general lack of artificial night lighting, Great Basin is one of the finest areas in the United States for experiencing the night sky. The park is designated as a class II area under the Clean Air Act as amended.

Great Basin provides exceptional views of the two broad basins to the east and west and the surrounding mountain ranges. At present, these vistas are relatively undisturbed by human developments. They are important because they offer breathtaking scenery and because the natural landscapes enhance the park's ability to interpret the Great Basin physiographic region and the forces that shaped it.

Vistas

Snake Valley dominates views from the eastern side of the park. At present the valley contains few developments - two small towns (Baker and Garrison), a state highway running north and south (Nevada Highway 487), a federal highway running east and west (US 50), several small ranches and irrigated fields, and gravel and dirt access roads. This valley is important as a scenic resource viewed by nearly all visitors and as an area for interpreting the geologic history of the basin (it was once the floor of Lake Bonneville), human settlement, and contemporary ranching.

Spring Valley dominates views to the west from Wheeler Peak and other points along the western crest of the South Snake Range in the park. The only visible developments in this valley are small ranches, a federal highway (US 93) running north and south the length of the valley, several gravel and dirt access roads, and several mine sites.

Little is known about the park's prehistoric resources because only about 2 percent of the park - primarily the areas around the Baker Creek cave system, Lehman Cave, and the alluvial fan that extends from the Lower Lehman Creek campground to the park entrance - has been systematically surveyed for archeological sites. Most of the historical sites are related to ranching or mining themes. Three sites - the Lehman orchard, Lehman aqueduct, and Rhodes cabin - were entered on the National Register of Historic Places in 1975. The Osceola (east) ditch and its component, the Stella Lake rock dam, are significant because of their relationship to the development of the large hydraulic placer mines at nearby Osceola. Knowledge about ethnographic resources in the park is lacking because ethnographic studies have not been initiated.

**Cultural
Resources**

PLANNING
OBJECTIVES

The following objectives are based on the direction provided in the park's authorizing legislation.

Manage the park to maintain the greatest degree of biological diversity and ecosystem integrity within the provisions of the authorizing legislation.

Eliminate or mitigate any impacts that threaten biological resources.

Determine the extent of plant and animal diversity, monitor the changes that are occurring, and identify the sources of change; eliminate or mitigate any identified adverse impacts, recognizing that native populations fluctuate naturally.

Monitor and evaluate biological diversity in relation to the influences of major climatic and environmental change, particularly those caused by man.

Protect threatened, endangered, and endemic species and restore them within their natural ranges.

Manage the grazing program to minimize effects on natural processes; adhere to the best range management practices, with an emphasis on protecting sensitive species.

Determine the natural role of wildland fire in the South Snake Range ecosystem, and manage the park to restore and maintain this process.

Develop an action plan for fire management.

Maintain the pristine quality of air, water, geologic, and scenic resources in the park.

Establish a baseline to determine resource conditions, monitor changes, and identify sources of change; eliminate or mitigate any human-caused impacts that threaten abiotic and scenic park resources.

Restore previously disturbed and abandoned areas (sites of mining activity, undesignated roads and trails, etc.) to natural conditions.

Continue to allow actions associated with valid existing mineral rights under regulated conditions

as long as there is no direct or indirect impact on exceptional resource values; if such actions are determined to be detrimental to exceptional resource values, notify and petition Congress for the funds to acquire the mineral estate.

Maintain an adequate supply of potable water to meet the present and future needs of park visitors and management.

Seek protection of present park water rights under Nevada water laws.

Preserve and protect caves and cave systems in the park.

Identify, inventory, and classify caves and cave systems, and eliminate or mitigate impacts on cave resources.

Avoid potentially harmful development in, above, or adjacent to caves unless it can be demonstrated that such development would not significantly affect natural cave conditions.

Minimize the adverse visual impacts of human activity on the Snake and Spring valleys through active, early consultation with government agencies and private interests; eliminate or mitigate the effects of any development or activity within the park boundary that intrudes on visitors' views of the park's scenic resources.

Allow only those recreational activities that contribute to understanding and appreciation of the park's resources and only to the extent that natural, cultural, and scenic values are not impaired.

Provide recreation information about other public lands in the region for visitors wishing to participate in high-impact activities or activities that are otherwise incompatible with the NPS mission.

Establish and maintain a broad spectrum of management zones and subzones to avoid limiting visitor use to the extremes of "paved and primeval."

Develop an interpretive initiative, including facilities, programs, and activities, that makes Great Basin

National Park the primary area for interpreting the theme of the Great Basin physiographic region.

Provide strategically located orientation media that meets the information needs of visitors.

Design an interpretive operation that recognizes and serves a wide range of visitors, including special populations.

Provide some interpretive programs and media designed to foster active visitor involvement.

Provide programs and media that heighten visitor awareness of the interrelationships of people and their environment; encourage a higher degree of personal responsibility for environmental concerns.

Preserve and interpret selected cultural resources that best illustrate significant aspects of the park's history and prehistory.

Encourage concessioners to market items that enhance visitor understanding and appreciation of Great Basin's ecosystem and history.

Provide a sense of anticipation for visitors before they reach the park.

Design a park entry and associated road corridor that contribute aesthetically to the park experience and to the learning experience of each visitor.

Encourage the production and distribution of previsit information materials in the region that encourage visitors to discover the park and prepare them to visit this remote area.

Locate NPS management facilities outside park boundaries whenever the management functions can be adequately supported from such locations.

Work with local communities and assist them in meeting community goals.

Work with adjacent communities to help them maximize economic benefits.

ACTIONS COMMON TO ALL ALTERNATIVES

MANAGEMENT ZONING CONCEPT

A management zoning concept has been developed for Great Basin National Park that focuses on diversity in planning for recreational experiences. The concept provides for a wide range of experiences – consistent with Park Service mandates, policies, and guidelines – thus avoiding the limitations of offering only frontcountry (modern and developed) and backcountry (primitive and undeveloped) use. The semi-primitive subzone, semi-primitive day use subzone, and rural subzone described below play a key role in establishing a continuum of experiences between the extremes of "paved and primeval."

The difference in the levels and types of use and the types of physical development for each zone and subzone is fundamental to the zoning concept. For example, early in the planning process, it was determined that driving on dirt roads provides a different and desirable type of visitor experience – different from hiking or driving on paved roads and desirable because it offers a "continuum" alternative to either of those activities. This type of experience was reserved for the rural subzone, where no paved roads and no major developments would be allowed.

The zones and subzones established under the management zoning concept would permit visitors to better understand what activities could and could not occur in different parts of the park. In addition, the management strategies outlined for each subzone would guide the actions of the superintendent and staff in maintaining the integrity of the zoning system and the individual subzones. The concept would provide direction for day-to-day management and operations as well as for long-term decision making to ensure that a range of experiences continued to be provided. As the park's personnel changed, the zoning concept would also direct the actions of future superintendents, visitor use specialists, resource management specialists, and maintenance personnel, providing management continuity over time. If future research, surveys, and assessments produced new information about the significance of natural or cultural resources, park management might make minor administrative adjustments to the zone boundaries to reflect this information. However, the idea of a continuum of experiences would continue to guide decisions.

The zoning concept includes three zones and seven subzones. The specific guidance for each subzone is

described using the following six categories: visitor experience, access, natural resource management, cultural resource management, facilities, and maintenance. In addition to the subzones, two special site designations are identified to give additional recognition and protection to outstanding natural and cultural features.

This zone would include all major park development required to serve visitors and meet the needs of management. It would encompass areas where park development and/or intensive use substantially alter the natural environment or the setting of historically significant resources.

Park
Development
Zone

Modern Subzone. The modern subzone would accommodate the highest levels of use in the park. Visitor activities would be fairly structured and involve little challenge. Support facilities and services would be extensive. Interparty contacts and contacts with NPS personnel would be frequent in this subzone, especially during the peak season. Contacts might be somewhat less frequent during the off-peak season, but would still be common compared to other subzones. There would be little or no opportunity for solitude. Relatively intensive resource management activity would be required in this subzone to mitigate impacts associated with high levels of visitor use and development. Although natural processes would be perpetuated wherever possible, major alterations and human intrusions would continue to be evident.

Visitor experience – The modern subzone would provide the primary experience for the majority of Great Basin visitors, introducing them to many of the park's significant resources and presenting the primary park themes. Guided tours, interpretive trails, films, slide programs, exhibits, and publications would be used to convey an understanding of what the "Great Basin" encompasses. Orientation and information would also be provided to assist visitors in planning their stays in the park and region. Cave tours and campgrounds included in this subzone might be managed under a permit system during the peak season.

Access – Access would be easy. This subzone would have both surfaced and unsurfaced roads, and all roads would be accessible by two-wheel drive vehicles. No off-road vehicle use would be permitted. Pedestrian

access would be along low- to high-standard trails that would allow people to explore a variety of environments.¹ A stable walking surface and artificial lighting would be provided for Lehman Cave.

Natural resource management – The natural character of lands within this subzone would be maintained as much as possible while accommodating high levels of visitor use. Wherever possible, previously disturbed areas would be used for new or expanded development. New structures and facilities would be designed and located to blend harmoniously with the environment.

To protect cave resources from direct disturbance from construction, where facilities were proposed on limestone or on alluvial deposits overlying limestone, the underlying areas would be thoroughly investigated for the presence of caverns before initiating construction. If it was determined that cave resources might be adversely affected, the facilities would be redesigned or an alternate location would be selected.

Vista clearing or other site modifications might be used to improve views and conditions in visitor use areas. In some areas visitors might be confined to hardened sites to reduce resource impacts. Native species would be used for all revegetation projects. Landscaping, mowing, and pruning would be carried out in appropriate areas.

Cultural resource management – Resources or sites in the modern subzone that were designated as outstanding cultural features might be restored (see the outstanding cultural feature classification). However, most cultural resources, including those selected to illustrate cultural resource interpretive themes and those listed on or eligible for listing on the National Register of Historic Places, would receive minimal stabilization. Cultural resources that do not fall into any of these categories would be left as is, with no action taken to preserve or remove them except to ensure visitor safety.

Facilities – All major developments would be confined to this subzone. Existing and potential modifications might include visitor centers, surfaced parking lots and roads, transportation systems, rustic and limited-service campgrounds, maintenance facilities, residential areas, water and sewage treatment facilities, and various other support facilities.

Maintenance – Maintenance activities would involve maintaining existing facilities (cleaning, painting, patching, striping, etc.), hardening sites, landscaping, providing for visitor convenience and comfort, protecting resources, and restoring areas disturbed by human activities. Roads, buildings, signs, walks, interpretive displays, landscaping, and other facilities would be maintained on a regular basis. Power tools would be used for routine maintenance activities, and heavy equipment would be used for road and utility system repairs and maintenance.

The emphasis in the natural zone would be on conservation of natural resources and processes. Various levels and types of visitor use that do not adversely affect those resources and processes would be accommodated in the subzones of the natural zone.

Rural Subzone. The rural subzone is a critical part of the zoning concept, because it provides an alternative to the highly structured experiences in the modern subzone and the backcountry experiences in the primitive and semi-primitive subzones. The types of visitor activities to be accommodated in this subzone (rustic camping, interpretation along trails, and access to hiking and horse trails) would permit opportunities for solitude except on peak season weekends. Interparty contacts and contacts with NPS staff would be moderately frequent during these times and infrequent on weekdays and during the off-season. Visitor challenge in the rural subzone would be low. A moderate amount of resource manipulation would be required to mitigate impacts associated with moderately high visitor use levels. Natural

¹ Three types of trails would be provided in the park – low, medium, and high standard. Low-standard trails would be designed and maintained for low volumes of horse and hiker traffic. Areas with difficult terrain or sensitive resources might be restricted to hiking only. Generally these trails would serve the more remote destination areas of the park. They would be unsurfaced, average about 18 to 20 inches wide, and have grades exceeding 15 percent in short sections. Medium-standard trails would accommodate higher volumes of horse and hiker traffic. These trails would generally be dirt-surfaced but in wet sections might be surfaced with rock or gravel or elevated on puncheon bridges. They would be about 24 inches wide, grades would not exceed 15 percent. High-standard trails would be designed for hiking only and would accommodate the highest volumes of traffic. Generally these trails would be short access routes to major interpretive or scenic attractions. They would be surfaced with crushed gravel or paved depending on location, use, and surrounding terrain. Widths would average 30 inches, and grades would not exceed 8 percent.

processes would be perpetuated and natural conditions would be maintained as much as possible, but some human alterations and intrusions would be evident.

Visitor experience – In the rural subzone there would be a sense of remoteness and solitude, but not of isolation from human activity. Visitors would be able to reach undeveloped areas of the park from gravel roads and stay overnight in rustic campsites. The gravel roads would contribute to the perception of remoteness, and the rustic campsites would be designed and designated to permit a high degree of solitude. For those who cannot manage the backcountry, this subzone would provide an alternative to mainstream visitation.

Off-site interpretation and education would be stressed for visitors to this subzone; however, low-profile signs and interpretive exhibit panels might be placed in selected locations to provide information, offer limited interpretation of the primary park themes, ensure protection of park resources, and provide for visitor safety.

Access – Access would be easy to moderately difficult. No surfaced roads would be provided, and all travel would be on unsurfaced roads accessible to vehicles. No off-road vehicle use would be permitted. Trails for both hikers and horseback riders would originate in this subzone. Short interpretive trails would allow visitors to discover areas of special interest.

Grazing permittees would be allowed to use vehicles (under special permit) on designated roads in this subzone to maintain grazing improvements such as springs, channels, pipelines, ditches, watering troughs, drift fences, and salt blocks. Vehicles might also be used for routine access or herd management.

Natural resource management – The natural character of lands within this subzone would be preserved to the extent possible while accommodating moderately high visitor use levels. Any apparent effects of visitor use would be mitigated, and disturbed areas that caused significant visual impairment would be restored. The cumulative effects associated with unacceptable levels of visitor use at campsites, along streams, or in other areas of visitor concentration would be prevented. The Park Service would maintain close control over resource-damaging activities. Research plots and

grazing facilities (fencing, water troughs) would be allowed under special use permit.

Cultural resource management – Cultural resources selected to illustrate interpretive themes and those listed on or eligible for listing on the National Register of Historic Places would receive minimal stabilization. All other resources would be left as is, with no action taken to preserve or remove them except to ensure visitor safety.

Facilities – Only limited development would be provided in this subzone; no major structures or facilities would be allowed. Gravel roads, low-profile interpretive panels and informational signs, unstaffed interpretive kiosks, trailheads, corrals, interpretive, hiking, and horseback riding trails, and campsites and campgrounds might be provided.

Campsites would be dispersed and designated. They would be rotated as necessary to allow resource restoration. Some campsites might be hardened using natural materials. Fire rings, picnic tables, and vault toilets would be provided, but there would be no potable water, electricity, or sewer connections. Campsites might be managed under a permit system during peak season. Although they would be accessible by vehicle, size restrictions might be placed on RVs and trailer-campers.

Maintenance – Activities would include maintaining roads and facilities (cleaning, painting, repair, pumpout, etc.), hardening sites, providing for visitor convenience and comfort, protecting resources, and restoring areas disturbed by human activities. Grazing improvements, trailhead corrals, fences, and other special permit structures would also require maintenance. Power tools would be used for routine maintenance activities. Heavy equipment might be used when visitation is low or when an emergency (flood, fire, or other catastrophic event) could endanger resources, visitor safety, or access.

Semi-Primitive Day Use Subzone. The semi-primitive day use subzone would accommodate visitors wishing to experience the park's significant natural and cultural resources close up and on foot. Interparty and NPS contacts would be frequent in this subzone during peak season, and opportunities for solitude would be limited, particularly along designated trail routes. Contacts would be less frequent during the off-season, and opportunities for solitude would be

greater. Challenge would range from low to high according to visitors' abilities. Moderate resource management activity would be required to mitigate impacts associated with high visitor use levels in this subzone. Naturalness would be emphasized but human alterations and intrusions would be evident.

Visitor experience - This subzone would bring visitors into direct contact with many of the park's natural and cultural resources. The natural character of semi-primitive day use areas would be maintained while providing interpretation and trail access for large numbers of visitors.

A variety of on-site interpretive media would be used to present the primary park themes and provide orientation and information. Interpretation and information might also be provided by rangers. A permit system might be used for trails that take visitors to more remote destinations.

Access - Access would range from easy to difficult. This subzone would be entirely roadless, and access would be along low- to high-standard trails that connect various destination points. Wheelchair access would be provided in selected areas to permit visitors with disabilities to experience representative park settings.

Public access would be limited to foot and wheelchair traffic; no horses, bicycles, or motorized vehicles would be permitted for recreational use. NPS personnel might use horses for difficult or remote maintenance activities. Emergency vehicles and aircraft would be allowed only in emergency situations.

Natural resource management - Because semi-primitive day use areas would have high concentrations of visitors and include some of the most significant resources in the park, livestock grazing would be prohibited in this subzone. The natural environment along trail corridors would be maintained to the extent possible, and human impacts would be minimized where sensitive environments and species occur. Unavoidable human impacts would be confined to resistant and less sensitive environments. Human impacts would be prevented or mitigated in areas identified as scenic environments. The Park Service would take maximum measures within the framework of the park legislation and the NPS management policies to minimize the impacts of nonrecreational resource uses.

Resources and uses would be carefully monitored in this subzone, and mitigating actions such as revegetation would be undertaken as required.

Cultural resource management - Resources or sites that were designated as outstanding cultural features might be restored (see the outstanding cultural feature classification). However, most cultural resources, including those selected to illustrate cultural resource interpretive themes and those listed on or eligible for listing on the National Register of Historic Places, would receive minimal stabilization. Other cultural resources would be left as is, consistent with visitor safety.

Facilities - Only limited development would be provided in this subzone; major structures and facilities would not be allowed. The primary development would be a day use trail system (including low- to high-standard trails) that would lead to destination areas and points of special interest. Unstaffed interpretive kiosks and outdoor exhibits might be included; no staffed facilities would be provided. No overnight camping or open fires would be permitted in this subzone. Vault toilets and picnic tables might be provided where appropriate.

Maintenance - Activities would include maintaining trails and interpretive facilities, hardening sites, providing for visitor convenience and comfort, protecting resources, and restoring areas disturbed by human activities. Power tools would not be permitted in this subzone unless the superintendent determined that such tools were necessary to respond to a life- or resource-threatening emergency or they were the minimum tools necessary to accomplish an essential task.

Semi-Primitive Subzone. This subzone would include scenic destination areas in Great Basin's backcountry and would be oriented to hiking and horseback riding on designated trails; primitive camping would be permitted, and backcountry campsites might be provided to support this use and protect resources. Interparty contacts, both on trails and at campsites, would be moderately frequent during the peak season; contacts in the off-season would be rare, and opportunities for solitude would be good. Contacts with NPS personnel would be limited in this subzone but more frequent than in the primitive subzone. Challenge would be moderate. Natural processes would be perpetuated in semi-primitive areas, and natural conditions would be maintained to the extent possible, but evidence of human alterations and

recreational use would be apparent along trails and in camping areas. Resource manipulation would be kept to a minimum, but some resource management actions might be required to reduce the impacts of visitor use.

Visitor experience – This subzone would provide opportunities to hike and horseback ride on trails through some of the park's most remote areas and to experience its natural and scenic resources in relative solitude. Although backcountry activities would predominate in this subzone, the expected levels of use along trails and in camping areas might not permit the type of wilderness experiences that would be accommodated in the primitive subzone.

Off-site interpretation and education would be stressed for this subzone. Most rules and regulations would be explained to visitors before they reached backcountry areas; however, low-profile signs would be installed as needed to protect park resources and provide for visitor safety.

Access – Access would be moderately easy to difficult. This subzone would be roadless, and low- to medium-standard trails would connect various destination points. Public access would be on foot or horseback only. NPS personnel and grazing permittees would also use horses or foot travel for activities in this subzone, except for situations that require aircraft or emergency vehicles.

Natural resource management – The natural environment along trail corridors and in camping areas would be maintained to the extent possible, and the impacts of human use would be minimized where sensitive species or environments occur. Unavoidable human impacts would be confined to resistant and less sensitive areas. Human impacts would be prevented or mitigated in areas identified as scenic environments. The Park Service would maintain close control over resource-damaging activities. Research plots and grazing facilities (fencing, water troughs) would be allowed under special use permit.

Resources and uses would be monitored in this subzone, and mitigating actions such as revegetation would be undertaken as required. Uses might be controlled or limited in sensitive areas, and campsites might be designated where necessary to protect resources from unacceptable impacts. A backcountry

permit system might be implemented if resources were threatened.

Cultural resource management – Cultural resources selected to illustrate interpretive themes and those listed on or eligible for listing on the National Register of Historic Places would receive minimal stabilization. Other resources would be left as is, consistent with visitor safety.

Facilities – No major developments would be permitted in this subzone, except for grazing improvements. Recreational facilities would be limited to trails, modest backcountry shelters, and minor structural improvements associated with backcountry campsites and trail construction.

Campsites (both walk-in and horse camps) would be designated where the effects of casual use require mitigation. Heavily used campsites where fire is allowed would have fire rings as well as pit toilets (at least 200 feet from lakes or streams). Backcountry shelters might be considered. Campsites for visitors on horseback would have hitch rails. No tables would be allowed.

Maintenance – Most maintenance activities would be for the purpose of protecting resources and restoring areas disturbed by human activities. Other activities would include maintaining trails, campsites, and informational signs. Some maintenance would be associated with grazing improvements. Power tools would not be permitted in this subzone unless the superintendent determined that such tools were necessary to respond to a life- or resource-threatening emergency or they were the minimum tools necessary to accomplish an essential task.

Primitive Subzone. The primitive subzone would be reserved for wilderness experiences. Challenge in this subzone would be high. Visitors would have infrequent contacts with one another or with NPS personnel, and they would be in an environment substantially free of human influence and alteration. Natural processes and conditions would be perpetuated in this subzone.

Visitor experience – The primitive subzone would provide abundant opportunities to experience the backcountry wilderness in solitude. It would be reserved for hiking and primitive camping only. Off-site interpretation and education would be stressed. No

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interpretive exhibits or signs would be provided. All rules and regulations would be explained to visitors before they reached primitive areas.

Access - Access would be difficult. This subzone would be roadless, and visitors would have to travel cross-country or on low-standard trails that provide connections over ridgelines. Hiking would in most instances not be oriented to specific destinations or points of interest. Orienteering and discovery would be encouraged.

Public access would be on foot only. NPS personnel and grazing permittees would use horses or foot travel for activities in this subzone, except for situations that require aircraft or emergency vehicles.

Natural resource management - The natural environment would be preserved to the extent possible while accommodating low-density backcountry use. Naturally occurring species would be maintained or reestablished, and populations of sensitive species would be protected or augmented. The introduction of nonnative species would be prevented to the extent possible, and attempts would be made to eliminate introduced species before they became established. The Park Service would maintain close control over resource-damaging activities. Research plots and grazing facilities (fencing, watering troughs) would be allowed under special use permit.

Monitoring would be carried out on a routine basis in this subzone, and mitigating measures (revegetation, species augmentation, and reintroduction of extirpated species) would be undertaken as needed. Uses might be controlled or dispersed if necessary to protect resources, however, with the anticipated light use, these measures are not expected to be needed. A backcountry permit system would be implemented if resources were threatened.

Some impacts that occurred before the park's establishment would be apparent for some time.

Cultural resource management - Cultural resources selected to illustrate interpretive themes and those listed on or eligible for listing on the National Register of Historic Places would receive minimal stabilization. All other resources would be left as is, consistent with visitor safety.

Facilities - No developments would be permitted in this subzone, and there would be no further modifications (except permitted grazing improvements) to the environment. No campsites would be provided.

Maintenance - Maintenance activities would be for the purpose of protecting resources and restoring areas disturbed by human activities. No recurring maintenance would take place except that associated with grazing improvements. Power tools would not be permitted in this subzone unless the superintendent determined that such tools were necessary to respond to a life- or resource-threatening emergency.

Protected Natural Area Subzone. This subzone would include lands and waters that are unusually fragile or ecologically or geologically significant. Strict protection measures would be employed to ensure perpetuation of these resources. Domestic livestock grazing would be prohibited in this subzone, and human intrusions would be minimized. Visitor experiences, access, natural and cultural resource management, allowable development, and maintenance in this subzone would be the same as in the primitive subzone.

Research Natural Area Subzone. This subzone would also include resources that are unusually fragile or ecologically or geologically significant, and protection measures similar to those in the protected natural area subzone would be implemented. Domestic livestock grazing would also be prohibited in this subzone, and human intrusions would be kept to a minimum. The major difference in management of this subzone would be that nonmanipulative observational research would be encouraged. Visitor experiences, access, natural and cultural resource management, allowable development, and maintenance would be the same as in the primitive subzone.

The special use zone would include lands within the park boundary where NPS administrative control is secondary to that of other government agencies or private interests (rights-of-way and utility corridors, for example). Allowable uses and facilities within this zone would be stipulated in special use permits between the Park Service and such interests.

Special
Use
Zone

Special Site
Designations

Outstanding Natural Feature. Geological and ecological features that illustrate the park's primary interpretive themes or that possess significant intrinsic value would be designated as outstanding natural features. Maximum protection would be afforded these resources while providing for public understanding and appreciation of them.

Outstanding Cultural Feature. Cultural sites, structures, and objects that illustrate primary park themes or that have aesthetic value and/or association with important personages, events, or periods in human history would be designated as outstanding cultural features. All properties listed on the National Register of Historic Places or designated as national historic landmarks meet these criteria. These resources would receive maximum protection and would be interpreted to provide for public understanding and appreciation of the park's history.

On-the-Ground
Identification
for
Management
Zones

To enable both NPS personnel and visitors to identify the zones and subzones while in the park, "on-the-ground" identification would be provided. Although zone boundaries would not be marked, in specific instances boundary determinations might have to be made to ensure that a certain action, activity, or use was not violating a zoning concept. The following zone definitions would allow field identification:

modern subzone

100 feet on each side of the centerline of all paved roads within the park boundary

400 feet on each side of the centerline of the proposed entrance road outside the park boundary (proposed action and alternative C only)

developed areas as designated by boundary lines (using contour lines where feasible) on 7½ minute USGS maps

rural subzone

¼ mile on each side of the centerline of designated gravel roads within the park boundary

200 feet on each side of the centerline of designated gravel roads outside the boundary

semi-primitive day use subzone

areas designated by boundary lines (using contour lines where feasible) on 7½ minute USGS maps

semi-primitive subzone

areas designated by boundary lines (using contour lines where feasible) on 7½ minute USGS maps

¼ mile on each side of the centerline of designated trail tread

primitive subzone

areas designated by boundary lines (using contour lines where feasible) on 7½ minute USGS maps

protected natural area

all areas in the park above 10,500 feet in elevation and the watersheds of Pine and Ridge creeks

research natural area

areas designated by boundary lines (using contour lines where feasible) on 7½ minute USGS map

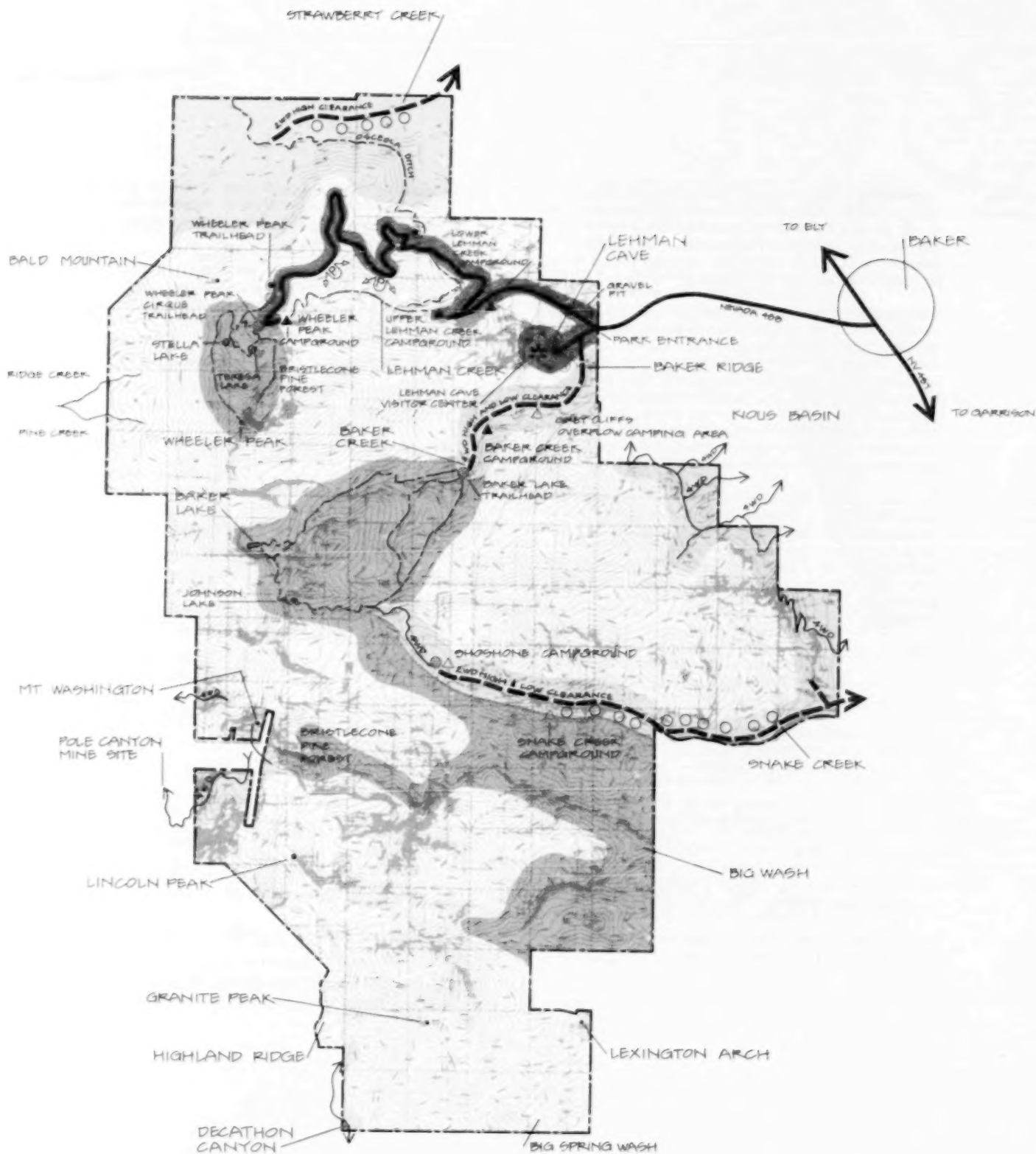
Existing Conditions. The management zoning concept was developed specifically for Great Basin National Park. In order to illustrate and evaluate the zoning changes that would occur under the proposed action and alternatives, lands within the park boundary were first zoned to reflect existing management strategies and visitor activities. The following zones and subzones apply to current developments and uses:

Application
of the
Zoning
Concept

park development zone - 939 acres
modern subzone - 939 acres
natural zone - 76,143 acres
rural subzone - 5,711 acres
semi-primitive subzone - 22,422 acres
primitive subzone - 48,000 acres
special use zone - 10 acres

Park developments and uses are shown on the following Existing Conditions map.

Proposed Action and Alternatives. The proposed action and alternatives were zoned based on their different



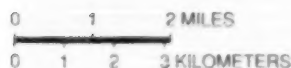
EXISTING CONDITIONS

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

148 • 20040 • DSC • SEPT 91

Management Zoning Concept



management emphases. Under all of the alternatives, primary consideration was given to the following criteria:

- protection of exceptional resources
- constraints imposed by the landscape
- provision of a reasonable range of visitor experiences
- perpetuation of traditional visitor experiences where appropriate

Endangered, threatened, and sensitive species, bristlecone pine forests, riparian and alpine/subalpine vegetation, and other exceptional resource values weighed heavily in determining zone and subzone boundaries. Exceptional resources were not compromised, but some alternatives placed a higher value on protection of these resources through zoning (i.e., the designation of large areas as primitive subzones, protected natural areas, or research natural areas). Other criteria also contributed to zoning decisions. For example, landscape constraints (steep escarpments) in the area of the Mt. Washington bristlecone pine forest limit access to and use of this area, whereas paved road and trail access to the Wheeler Peak cirque bristlecone forest encourages use there. Therefore, in the proposed action, different zoning was applied in these two areas (research natural area/primitive subzone at Mt. Washington, semi-primitive day use subzone at Wheeler Peak cirque). Both subzones provide protection for the prime bristlecone habitat; however, they offer different experiences and accommodate different levels of use.

Topography and terrain greatly influenced zoning. The more gentle slopes and associated drainages along the eastern side of the park have encouraged traditional use patterns because of ease of access. Access from the western side has been restricted by the steep terrain. Because of these restrictions and the undisturbed nature of the resources in this area, only one alternative (alternative C) included zoning and related developments to encourage access from the west. Zoning under the proposed action and the other alternatives would perpetuate the tradition of entering the park only along its eastern boundary.

Zoning under the proposed action and the alternatives would also support park managers in maintaining diverse park experiences and avoiding the pitfalls of providing only the extremes of backcountry and frontcountry use. Managers could apply the legislative mandate, NPS policies, the

ACTIONS COMMON TO ALL ALTERNATIVES

planning objectives, and the rationale associated with the zoning concept to develop the "limits of acceptable change" (see the following section) and to define what levels of use and development could and could not occur within each subzone. This would maintain the distinctions between the seven subzones over time.

Traditional uses and use patterns that were determined to be compatible with the legislative mandate, NPS policies, and planning objectives were perpetuated through zoning under the proposed action and alternatives. For example, Lehman Cave and the Wheeler Peak road would be placed in the modern subzone to provide the primary park experience, traditional dispersed camping would continue in the rural subzone, and large portions of the central and southern sections of the park would be zoned semi-primitive and primitive to preserve opportunities for backcountry experiences.

conditions unless and until there are signs of resource damage or degradation.

The LAC process includes four major activities:

specification of acceptable and achievable (desired) resource and social conditions, defined by a series of measurable parameters

analysis of the relationship between existing conditions and those judged acceptable and achievable

identification of management actions necessary to achieve desired conditions

monitoring and evaluation of management effectiveness

These four activities are broken down into eight steps:

1. identification of area concerns and issues
2. definition and description of what activities can and cannot occur in specific areas of the park; establishment of zones and subzones
3. selection of desired indicators of resource and social conditions
4. inventory of resource and social conditions
5. specification of standards for resource and social indicators
6. identification of management actions for zones and subzones
7. implementation of actions and monitoring of conditions
8. adjustment of actions as necessary to achieve desired conditions

Steps 1 and 2 have been completed as part of this planning effort (see the "Planning Issues and Concerns" and "Management Zoning Concept" sections). Steps 3 through 8 would be carried out by the park superintendent and staff after the general management plan is approved. The Forest Service LAC planning system (USFS, Stankey 1985) would serve as a guide, and an ongoing LAC management program would be established for Great Basin National Park.

LIMITS OF ACCEPTABLE CHANGE

Annual recreation visits to Great Basin National Park could grow to 78,000 by the year 2000. There were 40,400 visitors to Lehman Caves National Monument in 1986, the year before the park's establishment. In 1987 visitation to the new park jumped to 63,500 (a 57 percent increase), and in 1988 it grew to 73,600 (an increase of 16 percent over 1987). After this initial burst, visitation dropped by 4 percent in 1989 to 71,000.

Actual visitation since the park's establishment has closely paralleled the 1978 forecast model prepared by the Statistical Branch of the Denver Service Center (NPS 1987). The model predicted that there would be dramatic short-term increases in visitation because of the notoriety afforded the new national park. It also predicted that visitation would then gradually drop before settling down to a regular growth rate.

Although use of the park is expected to increase by approximately 76 percent from 1986 to 2000, sufficient data does not exist to determine whether or not the area can tolerate this amount of use. This planning effort does not attempt to determine "carrying capacity" — how much use the area can tolerate. Rather, it proposes that a limits of acceptable change (LAC) management program be implemented. The LAC system represents a reformulation of the recreational carrying capacity concept, with primary emphasis on the conditions desired in the area rather than on the amount of use the area can tolerate. The LAC system requires managers to define desired conditions and to undertake actions to achieve and maintain these

One assumption concerning the limits of acceptable change is being made as part of this planning effort. Based on studies and observations by the park staff over a number of years, the maximum acceptable level of cave use has been determined to be 20 tours of 30 persons, or a total of 600 persons, per day. The demand for cave tours already exceeds this maximum on some peak season weekends and on all six major holiday weekends – when as many as 300 people per day may be turned away – and it is expected to increase even more dramatically as park visitation grows.

Managers of many cave parks (especially those with large caverns) have adopted self-guided tour systems in response to rapid increases in visitation. However, because of the small size of Lehman Cave (narrow chambers and low

ceilings) and the large number of delicate features within easy reach of visitors, this option is not feasible for Lehman Cave. Because of this limitation and the fact that future research and monitoring may determine that a maximum acceptable use level lower than the 600 persons per day is required to protect cave resources, it is likely that Lehman Cave will not be able to meet the demands of increased visitation, particularly during the peak season. Therefore, one of the critical aspects of planning for Great Basin is to modify traditional use patterns and visitor activities to include a broader range of experiences involving other significant resources within and near the park. The proposal and alternatives in the following sections address possible ways to achieve that goal.

PROPOSED ACTION

DRAFT GENERAL MANAGEMENT PLAN / DEVELOPMENT CONCEPT PLANS

The proposed action for Great Basin National Park focuses on diversifying visitor opportunities by expanding interpretation of significant features in the park and the Great Basin physiographic region, improving access to and within the park, constructing a new visitor center, and offering new ways to view and appreciate the park's many resources. The zoning concept would be applied to establish a continuum of experiences - from organized and highly structured interpretation at Lehman Cave and in the Wheeler Peak area to rustic camping in the more rural portions of the park to wilderness experiences in the remote backcountry. Together, these actions would transform the area from a one-dimensional monument into a multidimensional national park.

The Park Service would review, evaluate, and make recommendations to local governments concerning all major development proposals that might affect the visual integrity of the Snake and Spring valley basins. Although outside the park boundary, these two basins are extremely important to the park purpose, and views of and across them are critical to the visitor experience. Park Service actions would aid in ensuring that the views associated with these basin landscapes would be preserved in perpetuity.

The proposed action constitutes the National Park Service's preferred alternative and draft general management plan for the park. The plan is the statement of intent for managing the area's resources, providing for legislatively authorized uses, and allowing for appropriate visitor use and interpretation of the resources.

ZONING RATIONALE

The zoning concept under the proposed action would provide a balanced range of recreational opportunities in the park. Most visitors would continue to concentrate in the Lehman Cave and Wheeler Peak areas, and two subzones (the modern and semi-primitive day use subzones) would be established in these areas to accommodate relatively high levels of use and permit visitors to easily reach and view many of the park's significant features. For visitors wishing to escape the mainstream of tourist activity, the rural subzone would provide opportunities for fishing, hiking, and dispersed camping in more remote areas. The southern portion of the park would be opened to more backcountry use by including large areas in the semi-primitive subzone and designating trails that would allow visitors to hike the

entire length of the park from north to south. Areas with special resource needs and concerns would be included in the protected natural area and research natural area subzones. The remainder of the park would constitute the primitive subzone. Primary road access to the park would be from the east side of the Snake Range.

The acreages of each zone and subzone would be as follows:

- park development zone - 1,148 acres
- modern subzone - 1,148 acres
- natural zone - 77,204 acres
- rural subzone - 2,341 acres
- semi-primitive day use subzone - 1,574 acres
- semi-primitive subzone - 28,486 acres
- primitive subzone - 33,196 acres
- protected natural area subzone - 9,334 acres
- research natural area subzone - 2,273 acres
- special use zone - 10 acres

These acreages include the approximately 1,280 acres in two sections of Forest Service land along the eastern park boundary adjacent to Baker Ridge that are proposed for transfer to the Park Service. The zoning concept is illustrated on the Proposed Action map.

Great Basin National Park is the only unit of the national park system lying deep within the Great Basin physiographic region. This immense natural area, more than one-third the size of Alaska, is one of the largest physiographic regions in North America. The park preserves significant examples of the high range ecosystems of this region - from arid desert shrub to limestone caverns to towering mountain peaks surrounded by remnant glacial features - and it offers commanding views of the basin landscapes below. As such, it provides innumerable opportunities to combine education and recreation, to both enjoy and learn about this remarkably diverse environment.

Although visitor use has increased since the park was established in 1906, yearly visitation is still relatively low. Most use occurs in the northern part of the park, in the Lehman Cave area and along the Wheeler Peak road.

VISITOR USE AND DEVELOPMENT

Recreational activities in these areas include touring the cave, sightseeing (on foot and by car), a variety of interpretive activities (guided walks, campfire talks, special programs), camping, fishing, picnicking, birdwatching, and other outdoor pursuits. The remainder of the park is largely undeveloped and accommodates hiking, fishing, rustic and backcountry camping, and orienteering. Spelunking is allowed under special use permit.

The proposed action would expand opportunities to experience representative portions of the Great Basin and to enjoy its many attractions. It would broaden the range of options to challenge virtually every visitor's level of interest and ability. A major component of the proposed action is the new interpretive initiative, which would provide the activities, programs, media, and services to encourage visitor understanding of the geologic, natural, and cultural evolution of the entire region and the national park. The following themes would provide the basis for interpretation:

- the Great Basin physiographic region, especially as represented by Great Basin National Park

- glacial processes and how glaciation influenced development of the Great Basin

- air-quality-related resources: the park's scenic and other values and their dependence on pristine air quality

- the unique scientific value of bristlecone pines

- the fragile alpine and subalpine environments

- cave ecology and the need for cave conservation

- the record of pioneer homesteading, agriculture, and mining activities associated with the area that is now the park

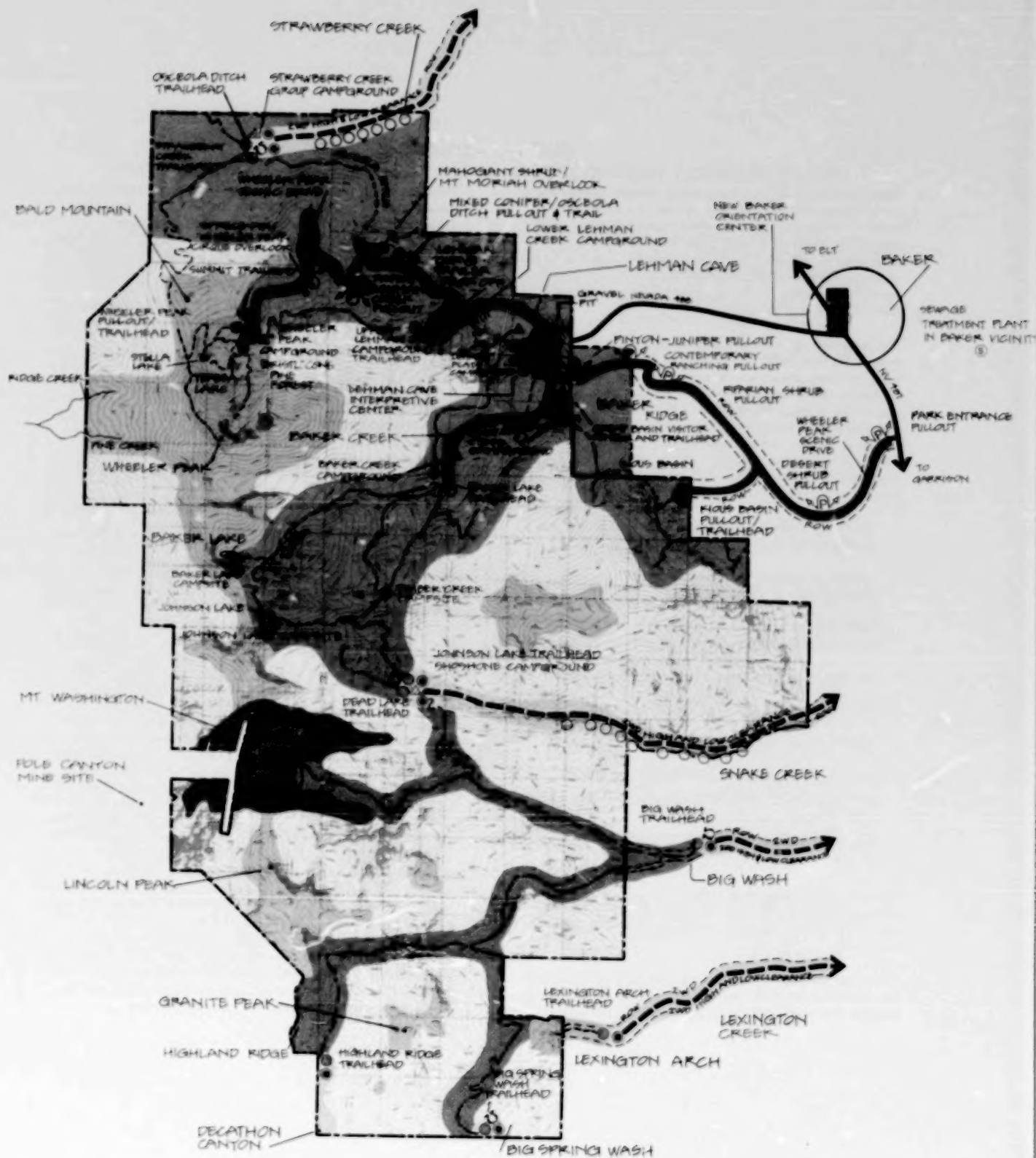
- native Americans who lived and continue to live in the Great Basin

Many of these themes would be illustrated through resource-oriented programs emphasizing the park's significant natural values and nonconsumptive uses of resources.

The major facilities to support interpretation would include the new Wheeler Peak Scenic Drive and its 11 associated pullouts (the scenic drive would include the existing 12-mile

Wheeler Peak road and a new 7-mile eastern extension that would pass through the basin environment), the new Great Basin visitor center on Baker Ridge, the rehabilitated Lehman Cave interpretive center (which would focus on cave interpretation), an integrated parkwide system of trailhead orientation exhibits and campground information shelters, and four regional interpretive exhibit shelters that would be constructed along the major highways leading to the park. Interpretive exhibit panels at the scenic drive pullouts and in other park areas would provide site-specific interpretation about the life zones and natural and cultural features visible from the sites. Trailhead orientation exhibits would help prepare visitors for safe, enjoyable hiking experiences by providing safety information, details about trail length and level of difficulty, trail route maps, and brief introductions to the areas through which the trails pass. Campground information shelters would provide safety information and details about the campgrounds and their immediate areas.

Other park developments would include campgrounds and campsites, roads, trails and trailheads, viewpoints, park headquarters, staff housing, and other administration and maintenance facilities. Facilities would be limited to those necessary to achieve the major planning objectives for the park - the protection of park resources and values and the provision of recreational activities that inspire visitors and contribute to their understanding and appreciation of the park. Where possible, existing facilities would be upgraded to meet the growing demand for services, and previously disturbed areas would be used for new park development. Disturbed areas that were not proposed for development would be revegetated with native species and restored to natural or near-natural conditions. All facilities would meet current design standards for health and safety, accessibility by visitors in wheelchairs, minimum water use, and vehicular travel, and design guidelines specific to the park would be developed to provide a unified design theme for facilities. All sites would be selected to maximize energy efficiency, on- and off-site views, soil suitability (ability of soils to support structures, roads, and trails), and cost efficiency. Sites considered for development would be evaluated for the presence of rare, sensitive, threatened, or endangered species and important cultural resources before design work was initiated. In addition, any sites overlying limestone would be thoroughly investigated for the presence of caves. Techniques have been developed for determining from the surface if there are caves underlying an area proposed for excavation or development. Investigations would be performed before structural designs were developed and the exact placement of facilities was decided. Funding for



PROPOSED ACTION

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
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Visitor Use and Development

- EXISTING PARK BOUNDARY
- PROPOSED PARK BOUNDARY
- RIGHT OF WAY
- SURFACED ROAD
- UNSURFACED ROAD
- HIKING/HORSE TRAIL
- HIKING TRAIL
- PARKING AREA
- ▲ LIMITED SERVICE CAMPGROUND
- △ RUSTIC CAMPGROUND
- △ GROUP CAMPGROUND
- RUSTIC CAMPSITE
- BACKCOUNTRY CAMPSITE
- * VISITOR CENTER
- ◆ INTERPRETIVE CENTER
- ◇ ORIENTATION CENTER
- W/P/WAYSIDE PULLOUT/INTERPRETIVE EXHIBIT
- Y TICKET SALES KIOSK
- TRAILHEAD
- Ω CORRAL
- ⌘ PICNIC AREA
- (A) ADMINISTRATION
- (M) MAINTENANCE
- (H) HOUSING
- (S) SEWAGE TREATMENT FACILITY
- (W) WATER STORAGE TANK
- //// DEVELOPMENT ELIMINATED/AREA REVEGETATED
- PRIMITIVE
- PROTECTED NATURAL AREA
- RESEARCH NATURAL AREA
- SEMI-PRIMITIVE
- SEMI-PRIMITIVE DAY USE
- RURAL
- MODERN



investigations would be included in the construction package for each project.

An important aspect of the plan would be the upgrading and expansion of the park's extensive trail system. Approximately 46 miles of trails would receive major rehabilitation or reconstruction; 13 miles would receive minor rehabilitation or extensive maintenance. The remaining 1 mile of trail is in satisfactory condition and would receive routine maintenance. Approximately 24 miles of new trails would be constructed to link existing trails, bringing the total trail mileage within the park to 84 miles. Of this total, roughly 64 miles would be open to horseback riders.

Trails would be graded to reduce erosion. Some trails would be relocated to minimize safety hazards. Continuous grades in excess of 15 percent would be lessened by constructing switchbacks or relocating portions of the trails to less steep areas. Obstructions such as downed trees and rockfalls would be cleared. Backslopes would be stabilized to allow revegetation. Portions of trails subject to caving in or slumping would be stabilized by stone retaining walls. Water bars, ditches, and other drainage structures would be utilized to correct drainage problems. Unhardened trails would be earth or rock surfaced; hardened trails would be surfaced with gravel (crushed granite or limestone), except those designated for wheelchair access, which would be paved with asphaltic concrete or similar surfacing. Bridges, signs, stone walls, and special surfacing would be installed as needed. Old roads and trails no longer in use would be recontoured and revegetated to return them to natural conditions.

The interpretive programs and services, recreational activities, and support facilities that are proposed for various areas of the park are described by subzone in the following sections and illustrated on the Proposed Action map.

The modern subzone would contain all of Great Basin's major, permanent facilities. Most information/orientation and interpretive services would be provided here. Museum exhibits, films and other audiovisual presentations, interpretive programs and demonstrations, and publications would be available in the new visitor center and redesigned interpretive center. Scheduled guided tours would be provided in Lehman Cave. Paved roads and hard-surfaced trails would enable visitors to easily reach the scenic viewing areas, campgrounds, picnic areas, and other attractions in this portion of the park. Ranger-led hikes and campground programs would be among the other services. The majority

Modern
Subzone

0 1 2 MILES
0 1 2 3 KILOMETERS

of park visitors would frequent this subzone, and there would be few opportunities for solitude.

Although the modern subzone would contain most of the park's developments, the natural environment in this subzone would only be altered to the extent necessary to provide the facilities to support visitor use. The 1,148-acre subzone would include an 800-foot-wide corridor along the Wheeler Peak Scenic Drive from Nevada 487 to the park boundary; a 200-foot-wide corridor along the Wheeler Peak Scenic Drive from the park boundary to the Wheeler Peak pullout/trailhead; a 200-foot-wide corridor along the Baker Creek road; and the acreage associated with the major developments along those road corridors.

The following proposals are presented in "tour" form and describe the park features and facilities that visitors would encounter as they entered the park and traveled through the modern subzone.

Highway Interpretive Exhibit Shelters/Baker Orientation Center. Visitors' first information about Great Basin National Park would be provided at interpretive exhibit shelters on the major highways leading to the park (see the Regional Orientation Exhibits map). These exhibit shelters would introduce visitors to the Great Basin physiographic region, each offering interpretation of the basin and range topography visible from the shelter - the South Snake Range (Great Basin National Park) and the basin foreground. The exhibits would also highlight the significance of the park and provide directions to the park and the park's orientation center in the town of Baker. The general locations for the exhibits would include

southwest exhibit shelter - US 93 southwest of the park, with a view of the west escarpment of the Snake Range

north exhibit shelter - US 50 on Sacramento Pass, with a view of the Wheeler Peak cirque

east exhibit shelter - US 50 just west of the Confusion Range, with a view of the eastern side of the Snake Range

southeast exhibit shelter - US 21 southeast of the park, with a view of the east escarpment of the Snake Range

The Baker orientation center would serve as a trip-planning center, providing more detailed information about the park as

well as basic information about the Great Basin region. Designed for both staffed and unstaffed operation, it might also be used to issue camping permits (by telephone when the facility was unstaffed).

The orientation center would be built on a an 80-acre site that straddles Nevada Highway 487 north of the existing park entrance road. The center would be on the small portion of the site on the west side of the highway; the larger eastern portion of the site would provide space for a number of administrative facilities that are proposed for relocation out of the park (see the "Administrative Facilities" description at the end of this section). The majority of visitors approach the park by driving south from US Highway 6/50 on Highway 487. The orientation center would be easily visible from this highway. A sign would also be placed on Highway 487 south of the park to direct visitors approaching from Garrison, Utah, to continue north to the orientation center to obtain park information.

The orientation center would be in a natural desert-shrub environment representative of the Great Basin. Any planted grass species would also be indigenous to the Snake Valley. Representative examples of plant species would be labeled, and the labels would include information about their range and ecological significance within the Great Basin.

A short paved entry road would provide access to the orientation center. A 25-car parking lot would be constructed, with pull-through parking for five RVs/buses. Bus parking would be separated from automobile parking by islands of desert-shrub vegetation. Seating would be incorporated into the parking lot for visitors wishing to remain near their cars. A barrier-free concrete pathway would lead visitors from the parking lot to the orientation facility. The concrete would be stained before placement to match the color of the desert soil. The path would accommodate visitors with mobility problems by incorporating a handrail and bench seating.

The orientation center would include a 100-square-foot room with a service window where rangers would provide information and orientation; information on campground status would be available, and campground permits might be issued. Orientation graphics, limited publication sales focusing on park orientation, self-service pamphlet dispensers, and a park bulletin board would be incorporated into the facility so that it could function without staff during the off-season. The center would also include a 400-square-foot restroom facility and a covered porch where visitors could obtain drinking water and plan their trips.

Interpretive brochures and pamphlets describing recreational opportunities in the region would be stored in the service room. Windows and skylights would provide natural lighting. Water would also be provided near the parking area for visitors who planned to camp where potable water was unavailable.

The average length of stay at the orientation center would be about 15 minutes – just long enough to get information about the park and the Great Basin region, to plan a stay, and to obtain a camping permit if desired.

Wheeler Peak Scenic Drive/New Park Entrance. After leaving the orientation center, most visitors would drive 1.9 miles south on Highway 487 to the entrance of Wheeler Peak Scenic Drive (see the Wheeler Peak Scenic Drive Development Concept Plan). A new 7-mile extension of the existing Wheeler Peak road would become the eastern portion of the scenic drive. This extension would be designed to provide unique interpretive experiences, introducing visitors to a variety of terrains and life zones and arousing their curiosity and anticipation. The scenic drive would pass through three life zones before crossing the park boundary and would provide views of both basin and range environments. Within the park it would provide access to the new Great Basin visitor center at Baker Ridge and would continue on through other life zones to the Wheeler Peak pullout/trailhead. The new scenic drive alignment and Great Basin visitor center would relieve some of the visitation pressure at the Lehman Cave facility, which is currently functioning at capacity during the peak season. From the visitor center, visitors could drive or hike to various destinations along Baker Creek and in Kiowas Basin, could visit Lehman Cave, or could continue on up Wheeler Peak Scenic Drive to hike, camp, and enjoy the scenery.

The entire length of the scenic drive east of the park boundary would traverse public lands, eliminating the need to acquire land or scenic easements. The Park Service would obtain a right-of-way from the Bureau of Land Management to construct the first 6 miles of the road within an 800-foot-wide corridor on BLM land. This corridor would provide protection from roadside development. Slightly over 1 mile of the road would traverse two sections of Forest Service land. The Park Service would seek transfer of these isolated sections to NPS management. The entire scenic drive would be maintained by the Park Service, with no additional expense or responsibility placed on White Pine County, the Nevada Department of Transportation, the Bureau of Land Management, or the Forest Service. The

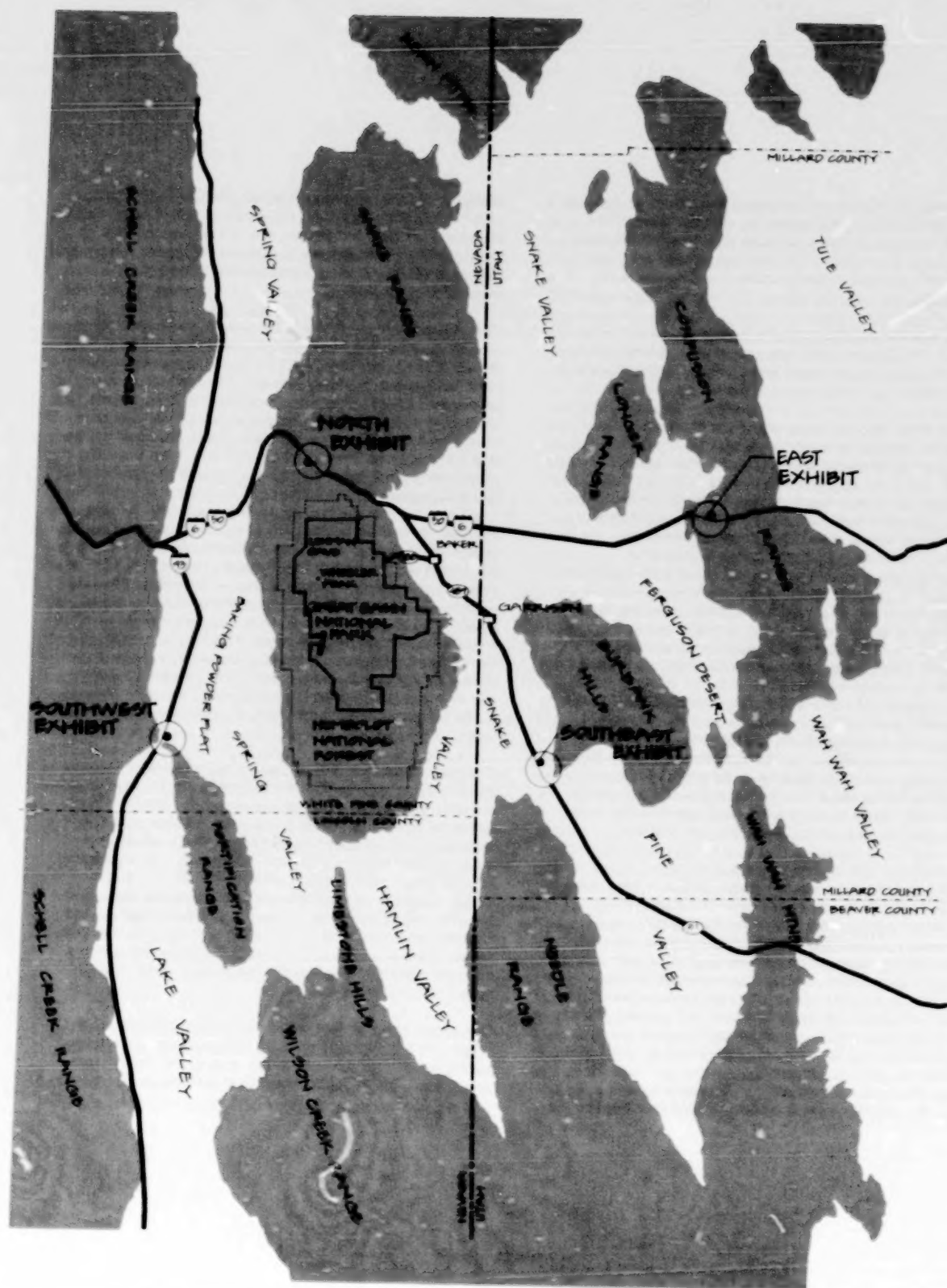
existing park entrance road (Nevada Highway 488) would be gated at the park boundary, and passage would be limited to administrative staff and people with special use permits. Local residents who live along Highway 488 outside the park boundary would still use this county-maintained road to reach their properties.

The new eastern extension of the scenic drive would conform to the natural terrain and would provide views of Mt. Moriah to the north, the Snake Range to the west, and the basin landscapes in the foreground. The road would be paved, with 11-foot-wide lanes and 2-foot-wide shoulders, and would be designed to function as a 40-mile-an-hour road. Completion of the road would require the construction of a bridge across Baker Creek. Work limit lines would be established to minimize damage to the roadway corridor during construction.

Six new interpretive pullouts would be constructed along this portion of the scenic drive from its intersection with Highway 487 to the park boundary (their specific locations would be determined during the design phase for the road). All of the pullouts except the park entrance pullout would be paved and provide space for 5 to 10 cars; the park entrance pullout would be paved but slightly larger. The pullouts would incorporate barrier-free access to viewpoints and interpretive media. Exhibit panels would be designed to reduce glare and to withstand the effects of wind, rain, and sun. They would be placed so that both children and adults could read them.

The park entrance pullout would be built near the intersection of the scenic drive and Highway 487, and a new entrance sign would be incorporated into the design. The entrance sign would signify the beginning of the park experience. It would be oriented toward the park and would be accessible along a short trail, which would permit visitors to photograph their friends and relatives with the South Snake Range as a backdrop. This pullout would also set the stage for the scenic drive. Interpretive exhibit panels would help visitors understand the life zone concept and anticipate the dramatic changes in elevation, vegetation, and scenery they were about to experience. The pullout would include paved parking for 15 to 20 cars.

The desert shrub pullout would be on the north side of the scenic drive within 2 miles of the park entrance. Interpretive panels would orient visitors to the foreground desert-shrub vegetation – the dominant vegetation type in the Great Basin



REGIONAL ORIENTATION EXHIBITS

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
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Visitor Use and Development

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0 5 10 MILES
0 5 10 15 KILOMETERS



– and to distant views and features of the Snake Valley basin.

A couple of miles up the scenic drive visitors would come to the Kious Basin pullout. Kious Basin is an anomaly in Great Basin National Park because of its unusual and picturesque granite outcroppings. It is one of the most scenic areas in the park, providing dramatic views of Mt. Moriah and the Snake Valley to the northwest. Numerous old jeep trails overgrown with vegetation traverse this area. Access from the scenic drive into the Kious Basin area would be along a 1-mile paved spur road leading to a 5- to 10-car paved parking area and interpretive pullout. Interpretive panels would feature the outcropping and other landforms visible from this location. The same spur road would provide access to a trailhead for the Kious Basin area. The trailhead would include a 15- to 20-car parking area and exhibits providing orientation, interpretation, and self-guiding pamphlets. Trails would lead from the trailhead into the basin and up to the Baker Ridge vicinity; the trails are described in the "Semi-Primitive Subzone" section.

The next pullout along the main entrance road would be the riparian shrub pullout, which would be on the hillside overlooking the Baker Creek drainage. Here visitors would learn about the importance of water in the desert environment and the significant role that riparian habitat plays in the Great Basin ecosystem. Interpretive panels would illustrate the changing character of riparian habitat in the desert below and the mountains above.

The contemporary ranching pullout would be on the north side of the scenic drive about 1 mile east of the park boundary overlooking the historic Roland Springs ranch, which is privately owned. Interpretive panels at this pullout would discuss the theme of ranching – past and present – in the Great Basin.

The last pullout before the Great Basin visitor center entrance would be the pinyon-juniper pullout, about 1/4 mile east of the park boundary on the north side of the road. This pullout would provide foreground views of the pinyon-juniper forest, with the South Snake Range peaks as a backdrop. Interpretive panels here would describe the extent and importance of this forest type in the Great Basin ecosystem.

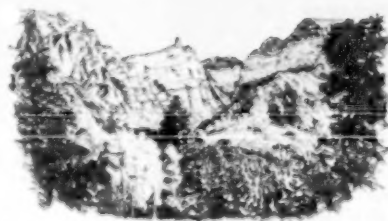
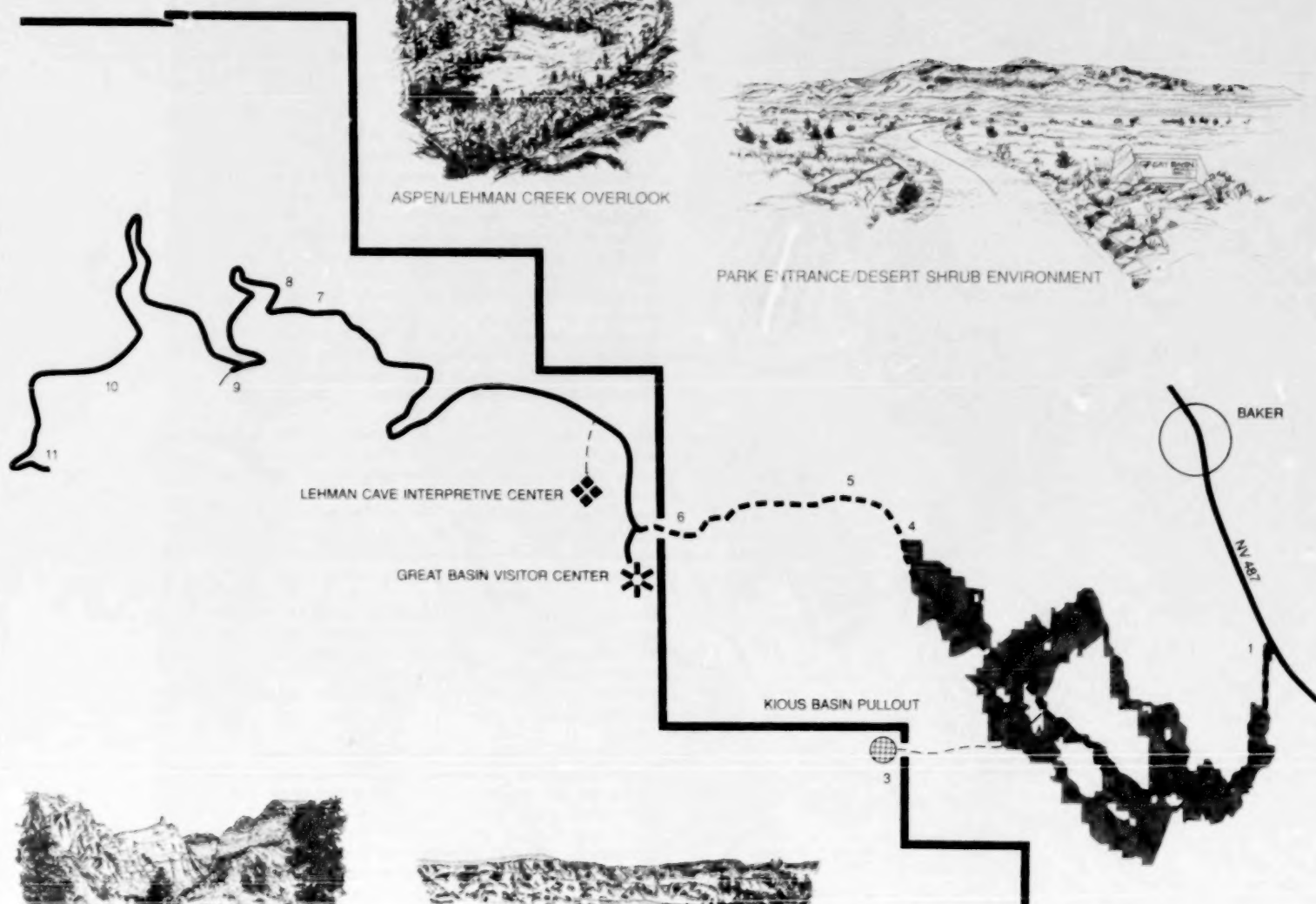
Great Basin Visitor Center. Driving up the new eastern extension of the scenic drive, visitors would receive an introduction to basin and range ecology spanning 1,500 feet



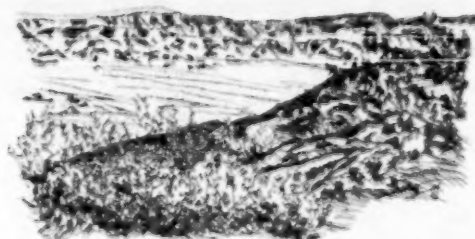
ASPEN/LEHMAN CREEK OVERLOOK



PARK ENTRANCE/DESERT SHRUB ENVIRONMENT



SPRUCE-FIR/WHEELER PEAK CIRQUE OVERLOOK



MAHOGANY SHRUB/MT. MORIAH OVERLOOK



PINYON-JUNIPER ENVIRONMENT



RIPARIAN SHRUB ENVIRONMENT

DEVELOPMENT CONCEPT PLAN WHEELER PEAK SCENIC DRIVE GREAT BASIN NATIONAL PARK

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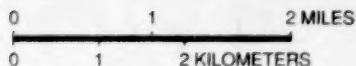
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INTERPRETIVE PULLOUTS

- 1 - PARK ENTRANCE PULLOUT
(ELEVATION 5,300 FEET)
- 2 - DESERT SHRUB PULLOUT
(ELEVATION 5,700 FEET)
- 3 - KIOUS BASIN PULLOUT
(ELEVATION 6,600 FEET)
- 4 - RIPARIAN SHRUB PULLOUT
(ELEVATION 6,120 FEET)
- 5 - CONTEMPORARY RANCHING PULLOUT
(ELEVATION 6,280 FEET)
- 6 - PINYON-JUNIPER PULLOUT
(ELEVATION 6,600 FEET)
- 7 - MIXED CONIFER/OSCEOLA DITCH PULLOUT AND TRAIL
(ELEVATION 8,200 FEET)
- 8 - MAHOGANY SHRUB/MT. MORIAH OVERLOOK AND TRAIL
(ELEVATION 8,450 FEET)
- 9 - ASPEN/LEHMAN CREEK PULLOUT
(ELEVATION 9,200 FEET)
- 10 - SPRUCE-FIR/WHEELER PEAK CIRQUE OVERLOOK
(ELEVATION 9,600 FEET)
- 11 - WHEELER PEAK PULLOUT/TRAILHEAD
(ELEVATION 9,920 FEET)



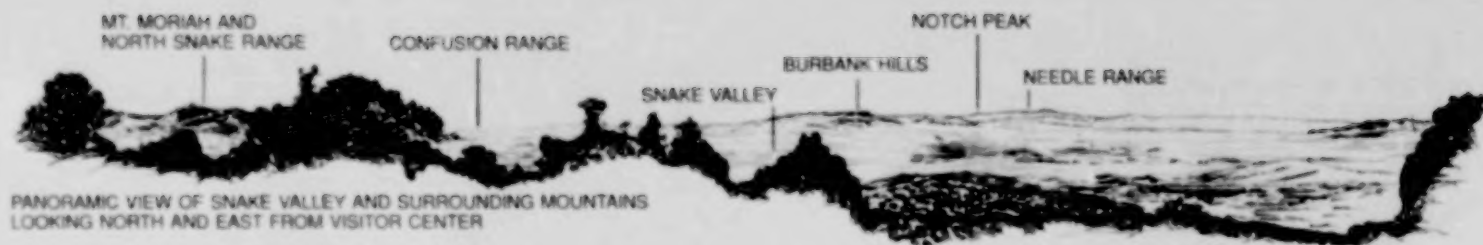
-  COMPUTER GENERATED CORRIDORS
-  POSSIBLE ROAD ALIGNMENT WITHIN CORRIDOR
-  CONSTRUCTED ROAD
-  ROAD TO BE CONSTRUCTED
-  SECONDARY ROAD TO BE CONSTRUCTED
-  SECONDARY CONSTRUCTED ROAD



of elevation and three life zones. Just 1/4 mile inside the boundary the entrance road would curve to the south and would lead to the new Great Basin visitor center, the main interpretive facility for the park (see the Baker Ridge Development Concept Plan). Here visitors would be able to learn about all of the park's major natural and cultural history themes and gain an overview of the entire Great Basin physiographic region. The new visitor center would be a full-service facility, offering orientation and trip planning services as well as a wide range of media, including films, audiovisuals, exhibits, and interpretive publications. It would be open year-round.

The visitor center would be nestled in a saddle on Baker Ridge. This site was selected for its distant views of basin and range features and its closer views of the northern Snake Range, including Snake Valley, the Confusion Range, the Conger Range, the Ferguson Desert, Burbank Hills, Pine Valley, and the Wah Wah Mountains. Dominant peaks within the Snake Range can also be seen when looking west from the visitor center site. The visitor center would be designed and located to take full advantage of these views, and it would include a large outdoor viewing deck.

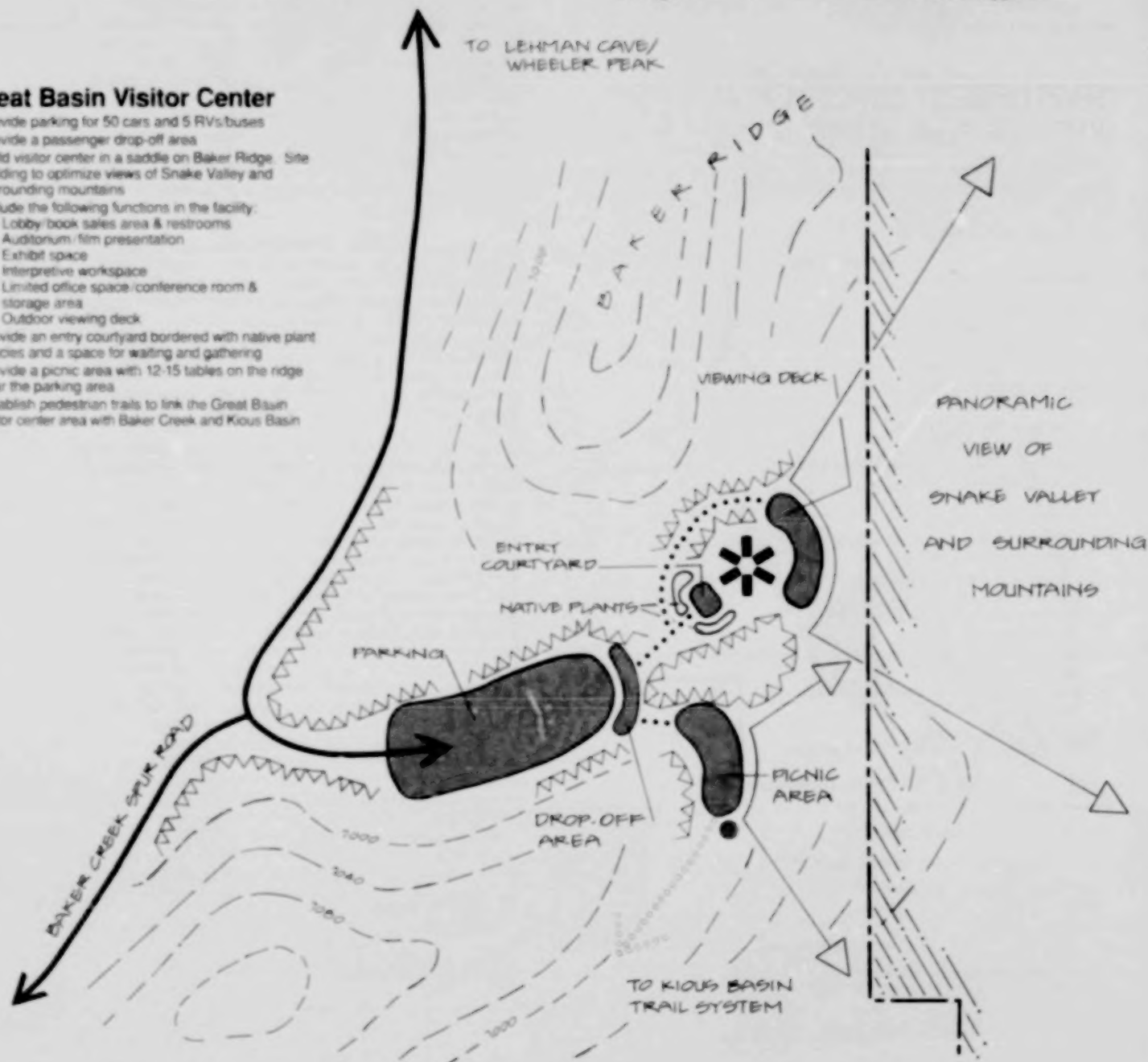
The visitor center would be situated in a pinyon-juniper forest and landscaped with shrubs characteristic of this vegetation type. The approximately 5,000-square-foot facility would include a lobby with an information/reception desk and trip-planning center, a natural history association book sales area, and a separate counter where campground permits could be issued during the off-season; a 75-seat auditorium; exhibit space; restrooms; an entry court; and a large east-facing viewing deck. There would also be space for a superintendent's office/conference room, interpretive staff office and work space, a natural history association office (near the sales area), and storage. Adequate circulation would be provided for visitors coming and going from the auditorium and exhibit area, both of which would be accessible from the lobby. The sales and publication display area would be out of the main circulation area but in view of the information desk. Public restrooms would have outside as well as inside entrances so that their use would not add congestion in the lobby area. Administrative work and storage spaces would be well separated from visitor spaces. The building would be fully accessible to disabled visitors and staff. It would be designed to minimize the heating effects of summer sun and maximize the warming effects of winter sun. Skylights and windows would be used throughout to increase natural lighting. Functional spaces are shown on the visitor center schematic.



PANORAMIC VIEW OF SNAKE VALLEY AND SURROUNDING MOUNTAINS
LOOKING NORTH AND EAST FROM VISITOR CENTER

Great Basin Visitor Center

- Provide parking for 50 cars and 5 RVs/buses
- Provide a passenger drop-off area
- Build visitor center in a saddle on Baker Ridge. Site building to optimize views of Snake Valley and surrounding mountains
- Include the following functions in the facility:
 - Lobby/book sales area & restrooms
 - Auditorium/film presentation
 - Exhibit space
 - Interpretive workspace
 - Limited office space/conference room & storage area
 - Outdoor viewing deck
- Provide an entry courtyard bordered with native plant species and a space for waiting and gathering
- Provide a picnic area with 12-15 tables on the ridge near the parking area
- Establish pedestrian trails to link the Great Basin visitor center area with Baker Creek and Kious Basin



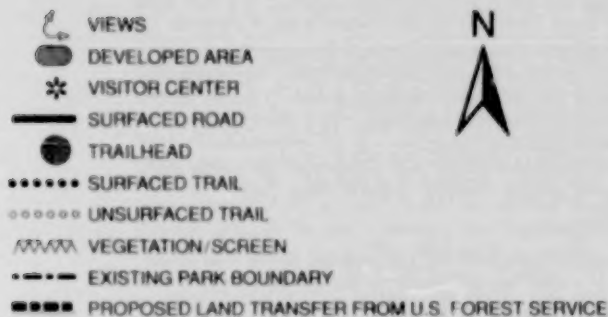
DEVELOPMENT CONCEPT PLAN BAKER RIDGE

GREAT BASIN NATIONAL PARK

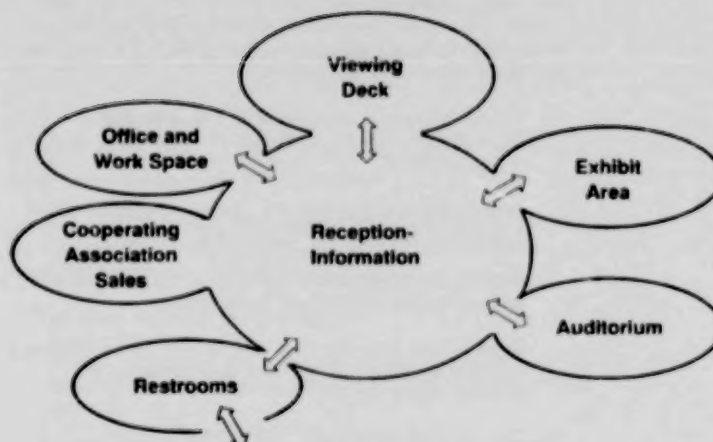
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Visitor Use and Development



0 200 400 FEET



Visitors would arrive at a 50-car, five-bus/RV parking lot just west of the visitor center. Parking for cars and buses would be separated by islands of pinyon-juniper vegetation and native grasses, and shade structures and seating would be included so that people could rest near their cars. The parking lot would incorporate a passenger drop-off, and bike racks would be provided nearby. It would be built in an area previously used as a rifle range and a borrow pit. The area would be reclaimed and revegetated after the parking lot was constructed.

A paved, barrier-free pathway would lead from the passenger drop-off through 100 feet of sparse pinyon-juniper forest to the visitor center entry court. The pathway would be about 8 feet wide to accommodate two-way travel. The entry court would incorporate space for tour groups of 50 to 60 people as well as smaller groups. Seating areas, drinking fountains, shade structures, and access to restrooms would be provided. The entry court would include interpretive panels identifying significant peaks and landforms visible to the west.

PROPOSED ACTION

The lobby area of the visitor center would provide information, orientation, and trip-planning services to permit visitors to familiarize themselves about the park and region. However, the primary attraction in the center would be a film that would accomplish the following:

- Provide a basic understanding of the Great Basin physiographic region and the park's significance as part of this landform.

- Convey the message that the park is a mountain island in a desert sea (island biogeography).

- Illustrate the responses of humans, plants, and animals to the stresses of this harsh environment.

- Show visitors how their own actions may be contributing to global warming and how the park serves as an indicator of this trend.

The film would be presented in the 75-seat auditorium, and its message would be complemented by providing in-depth treatment of selected aspects of the Great Basin story in the nearby exhibit area. The following subjects would be the focus of interpretation:

natural history

- life zones and major habitats
- island biogeography
- climatic change
- glacial geology
- bristlecone pines
- threatened species
- topographical points of interest

cultural history

- native Americans in the Great Basin (past and present)
- frontier settlement
- ranching and agriculture
- mining (past and present)

The final interpretive experience at the visitor center would take place on the outdoor viewing deck, where visitors would be able to immediately associate the subjects in the Great Basin film and exhibits with the magnificent panorama of Snake Valley and the distant basins and ranges. Part of the deck area would be shaded, and outdoor space for interpretive exhibit panels and programs would be provided. Movable outdoor seating would be provided. A path would

connect the viewing deck with the entry court so that visitors could return to the parking area without passing through the visitor center.

A picnic area and a trailhead would be developed near the southwest end of the visitor center parking lot. The trailhead would provide access to an extensive system of hiking and horseback trails at lower elevations in the Baker Creek and Kious Basin areas. An interpretive trail guide dispenser would be installed at the trailhead. Equestrian access to the trail system would be provided near the Grey Cliffs campground.

Baker Creek. A branch of the road leading to the new Great Basin visitor center would extend on into the Baker Creek area, where opportunities for hiking, horseback riding, and camping would be available. The Grey Cliffs campground, about 1 mile up the spur road from the visitor center, would be modified to provide group camping only. Three of the four loops at the existing campground would be removed and revegetated because they are in a hazardous wildfire area (the only escape route is downslope through an area where wildfire is likely to be advancing). are in the apparent floodplain of Baker Creek, and are adjacent to archeological sites and cave entrances. The upper loop would be converted to a group camping area with six paved pull-ins, 12 picnic tables, six fire grates, a formalized group campfire circle, and two vault toilets. No potable water or electricity would be provided. A new 1/8-mile paved road would provide access to the campground. A trailhead and corral would be developed in the vicinity of the campground to permit equestrian access to the Baker Creek, Kious Basin, and Baker Lake trail systems.

The existing 32-site limited-service Baker Creek campground would continue to accommodate tent, RV, and trailer camping, and the gravel campground roads would be maintained. The campsites would be upgraded and a group campfire circle would be established, but there would be no major redesign of the roads or campground layout. New vault toilets would be provided. One campsite would be redesigned for disabled visitors, and barrier-free toilets would be included. Potable water would be available.

A paved 20-car parking area would be constructed at the existing Baker Lake trailhead. A separate unpaved parking area for vehicles with horse trailers and a corral would be built nearby. The trailhead would provide access to the Baker Lake loop trail system and connecting trails as well as to Lehman Creek, Baker Creek, and Kious Basin.

Lehman Cave. After stopping at the Great Basin visitor center, most visitors would travel to Lehman Cave to take a cave tour and continue on up Wheeler Peak Scenic Drive to the Wheeler Peak trailhead and parking area. All of these sites and features would be included in the modern subzone, and appropriate support facilities would be provided. Lehman Cave would continue to be a popular visitor attraction, and the existing visitor center there would be redesigned as an interpretive center offering in-depth interpretation of cave resources. To provide adequate space for cave interpretation, all administrative functions except two interpretive staff offices would be removed from the building and relocated to the Baker site (see the "Administrative Facilities" section). Cave tour ticket sales would be relocated to a new ticket sales kiosk to reduce congestion in the interpretive center. The existing concession operation and natural history association sales outlet would be retained. Proposed changes to the Lehman Cave area are shown on the Lehman Cave Development Concept Plan.

Visitors would approach Lehman Cave along a new paved spur road extending south from Wheeler Peak Scenic Drive (road changes in the Lehman Cave area are described in the following "Road Modifications" section). The road would end at a new 70-car/30-bus/RV parking lot, which would be designed in two levels stepped down the hillside to minimize their visual impact. A portion of the parking lot would be built on previously disturbed land near the existing picnic area in a pinyon-juniper forest setting. Islands of native vegetation would be incorporated into the parking lot, and some seating and shade structures would be provided. Parking for oversized vehicles would be separated from car parking by vegetation and topography.

The portion of the existing entrance road and lower parking lot in front of the Lehman Cave interpretive center would be removed to improve visitors' views of the Snake Valley basin from the building's front porch, to reduce the levels of congestion in front of this facility, and to provide more room to reestablish a portion of the historic Lehman orchard. After the road and parking lot were removed, the area would be recontoured and revegetated with native grass and shrub species. The existing upper parking lot in front of the interpretive center would be retained to provide parking space for service vehicles, emergency vehicles, and disabled visitors; it would be accessible from the new parking lot.

A cave ticket sales kiosk with attached restrooms and an open-air shelter and new picnic area with 12 to 15 tables would be constructed next to the new parking lot. The ticket sales kiosk would include a service window and a small information exhibit area providing cave information and tour schedules. It would be staffed during peak use periods. A 1,000-foot-long wheelchair-accessible paved trail beginning at the ticket kiosk would wind through the pinyon-juniper forest to the interpretive center entrance. The trail would incorporate seating areas and handrails.

The Lehman Cave interpretive center would offer a new film, exhibits, and interpretive publications. The following themes would be developed, using a variety of media:

- geologic formation of the cave
- cave decorations
- human impacts on the cave/cave conservation
- interrelationships between the cave and the surface
- cave life
- early inhabitants and discovery of the cave

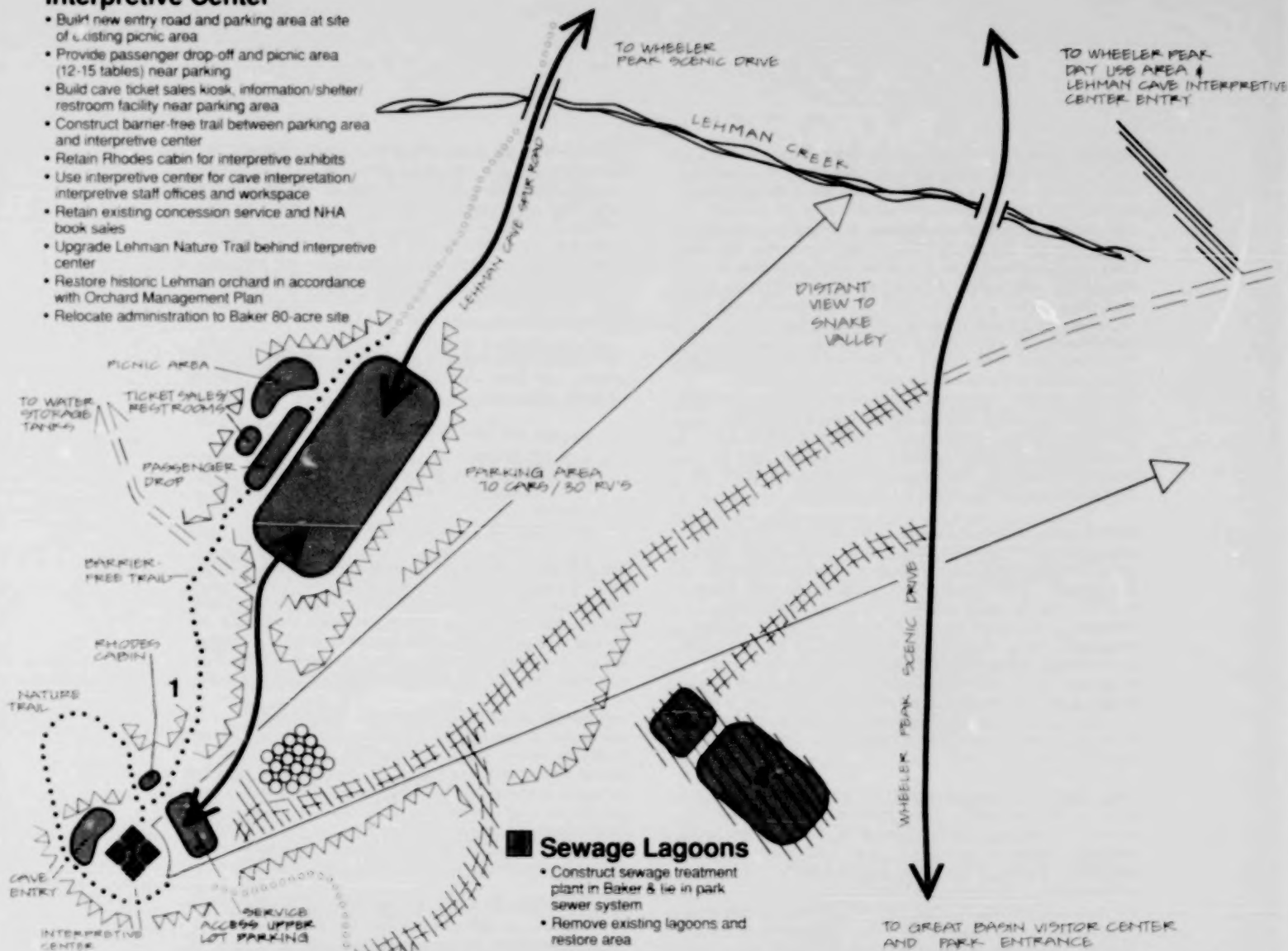
The building interior would be redesigned to provide space for a 75-seat auditorium, a new exhibit area, a lobby/natural history association sales and storage area, restrooms, and the two staff offices. The concession facility (restaurant and gift sales) would remain in its present location; the facility would be redesigned and remodeled to improve efficiency and visitor services, but it would not be increased in size.

The exterior of the interpretive center would remain unchanged except that the entry area would be redesigned to provide barrier-free access. Exhibit panels would be placed on the front porch to identify landscape features and themes associated with the views of the Snake Valley basin and the restored Lehman orchard in the foreground. The Park Service would continue to irrigate the shade trees and lawn areas in front of the building to provide a pleasant place for visitors to relax while waiting to take a cave tour.

Maximum cave use would be maintained at 20 guided tours of 30 persons, or 600 persons, per day unless future research indicated the need for a lower volume of cave use to protect fragile cave resources. Tours would last 1½ hours. The option of providing more tours of shorter duration was considered; however, the 1988 visitor survey indicated that the majority of visitors were not interested in shorter or longer cave tours. Cave access would continue to be through a man-made corridor next to the patio at the rear of

Lehman Cave Interpretive Center

- Build new entry road and parking area at site of existing picnic area
- Provide passenger drop-off and picnic area (12-15 tables) near parking
- Build cave ticket sales kiosk, information/shelter/restroom facility near parking area
- Construct barrier-free trail between parking area and interpretive center
- Retain Rhodes cabin for interpretive exhibits
- Use interpretive center for cave interpretation/interpretive staff offices and workspace
- Retain existing concession service and NHA book sales
- Upgrade Lehman Nature Trail behind interpretive center
- Restore historic Lehman orchard in accordance with Orchard Management Plan
- Relocate administration to Baker 80-acre site



Maintenance Area

- Relocate maintenance operations to Baker administrative site
- Retain one structure for fire cache and back-up generator for cave
- Demolish other buildings and restore area

Housing Area

- Within the park, retain only number of houses needed for security reasons
- Remove trailers and other temporary structures
- Locate all new housing and apartments at Baker administrative site

Sewage Lagoons

- Construct sewage treatment plant in Baker & tie in park sewer system
- Remove existing lagoons and restore area

DEVELOPMENT CONCEPT PLAN LEHMAN CAVE

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Visitor Use and Development

- ◆ INTERPRETIVE CENTER
- == EXISTING ROAD
- SURFACED ROAD
- SURFACED TRAIL
- o o o o o UNSURFACED TRAIL
- ▨ RESTORED AREA
- ▨ VEGETATION/SCREEN
- DEVELOPED AREA
- ↪ VIEW
- ⊞ ORCHARD



0 200 400 FEET

the interpretive center. The first room in Lehman Cave would have barrier-free access. Opportunities to take ranger-guided spelunking tours of other caves in the area would continue to be available if supported by cave research and the findings of the cave management plan proposed in the "Future Studies and Plans" section.

The historic Rhodes cabin, which predates the establishment of Lehman Caves National Monument, was built to provide overnight lodging for tourists visiting Lehman Cave when the property was in private ownership. The cabin has been moved from its original location, restored, and placed on a concrete foundation next to the interpretive center. It would be adaptively used to house new interpretive exhibits on its early history and original lodging function. An interpretive panel would be installed outside the cabin to inform visitors of its history.

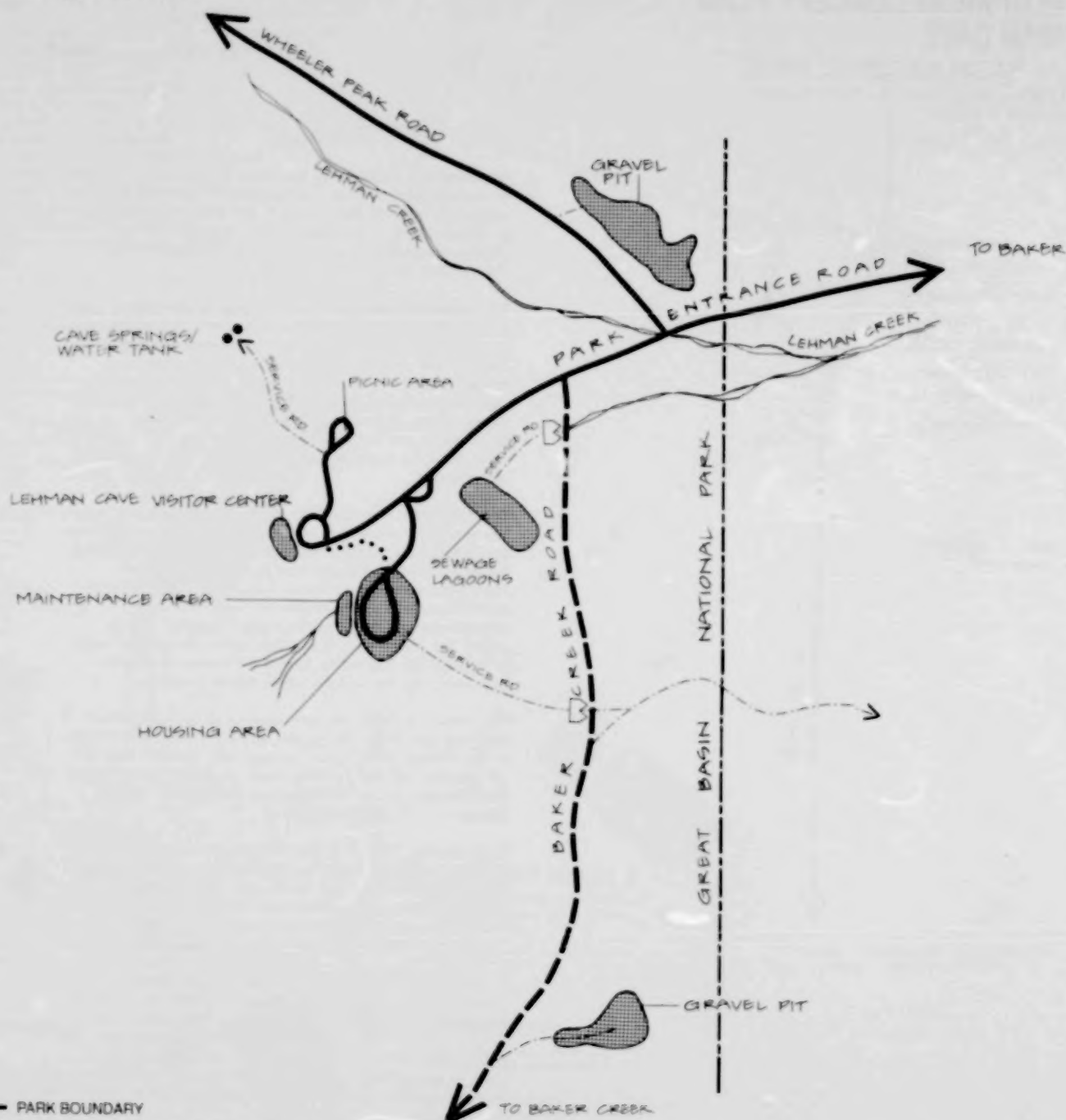
The historic Lehman orchard, which currently contains only a few remnant fruit trees, is representative of early agricultural and horticultural development associated with mining camps. Based on the direction provided in the 1990 *Orchard Management Plan*, the orchard is currently being restored and expanded to approximately 40 trees, and a water-conserving drip irrigation system installed. Exhibit panels are proposed in the vicinity of the interpretive center to interpret the orchard as part of the historic landscape. Trail access to the orchard would not be provided.

The existing 0.1-mile Lehman nature trail, an interpretive loop trail behind the interpretive center that begins and ends at the Rhodes cabin, would be upgraded. Interpretation of the geology and history of Lehman Cave and history of the Rhodes cabin would continue to be provided on the trail through a self-guiding publication.

Road Modifications – Baker Ridge/Lehman Cave Area. Road modifications would be undertaken to improve access and circulation in this part of the park. The modifications are described below and illustrated on the Existing and Proposed Road Alignment maps for the Lehman Cave vicinity and on the Wheeler Peak Scenic Drive Development Concept Plan.

A new intersection would be established just inside the eastern park boundary to permit direct access to the Great Basin visitor center along an extension of Wheeler Peak Scenic Drive. At this intersection visitors could take the scenic drive south to the visitor center on Baker Ridge or north to the Lehman Cave developed area and on up to Wheeler Peak. A spur road on the scenic drive's southern

TO WHEELER PEAK

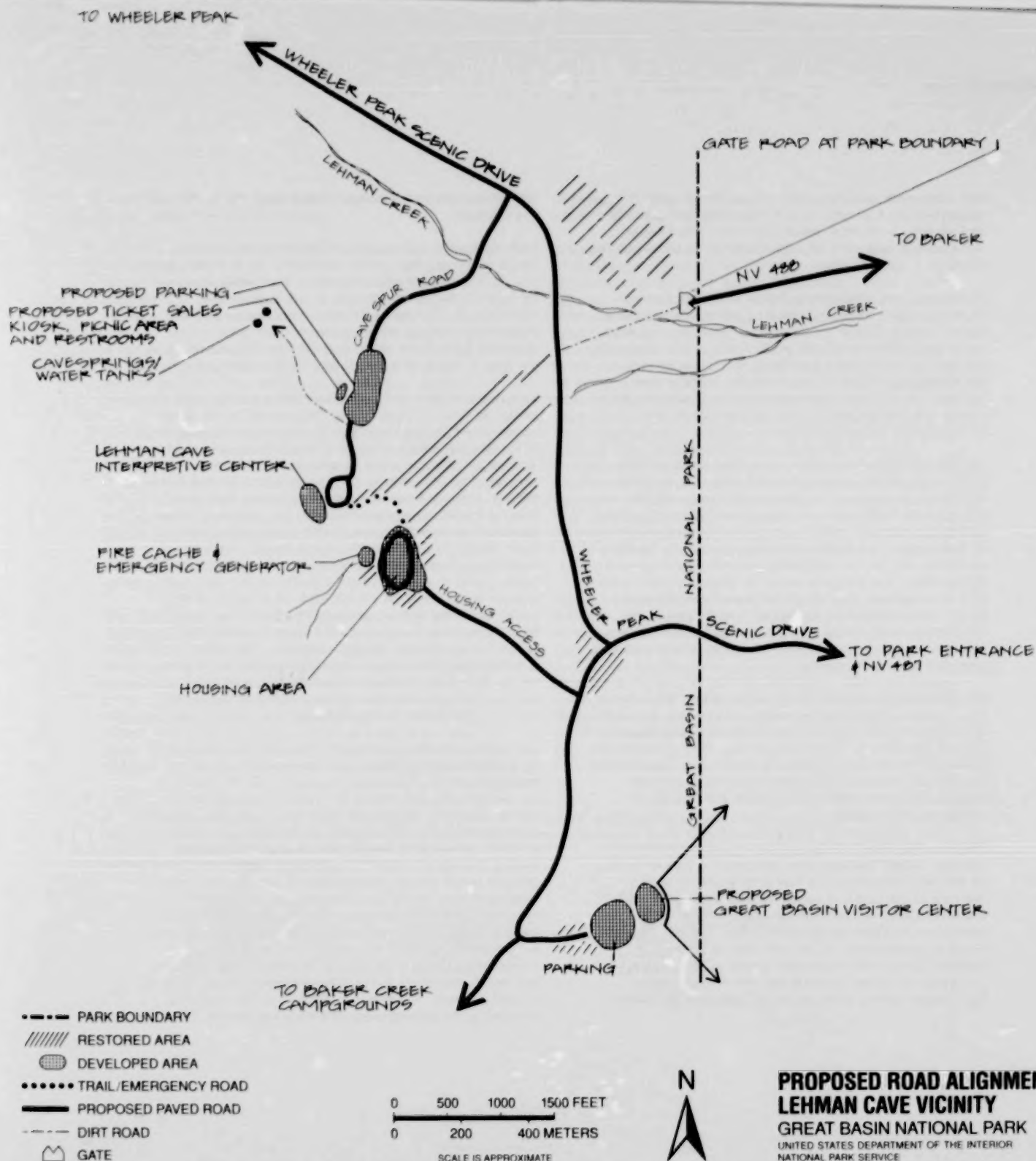


- PARK BOUNDARY
- ◻ DEVELOPED AREA/DISTURBED AREA
- EXISTING TRAIL
- EXISTING PAVED ROAD
- - - EXISTING GRAVEL ROAD
- - - EXISTING DIRT ROAD
- ◻ GATE

0 500 1000 1500 FEET
0 200 400 METERS
SCALE IS APPROXIMATE



**EXISTING ROAD ALIGNMENT
LEHMAN CAVE VICINITY**
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PROPOSED ACTION

extension would provide access to the Baker Creek developments. A second, 1/2-mile-long spur road about 3/4 mile to the scenic drive would lead to the new Lehman Cave parking area. This new spur road would cross Lehman Creek on a small bridge.

The scenic drive between the Baker Creek and Lehman Cave spur roads would incorporate portions of the existing Baker Creek and Wheeler Peak roads. However, the drive would be realigned to form a gradual curve, thus eliminating two existing 90 degree turns. Road work would involve construction of 1/2 mile of new road and a bridge over Lehman Creek. These road improvements would simplify the major road configuration in the park and provide an improved park entry experience.

The Baker Creek and Lehman Cave spur roads and the entire length of the scenic drive, including all associated access roads to developed areas, would be paved. All intersections, entrances, and pullouts would be designed to safely accommodate traffic flows. Following road realignment, all abandoned road sections would be restored to natural conditions. An old road alignment extending west from the Baker Creek road would be paved to provide access to the NPS housing area south of the Lehman Cave interpretive center. The existing housing access road in front of the interpretive center, along with the existing Lehman Cave entrance road and lower parking lot, would be removed and replanted with native species.

Continuation of Wheeler Peak Scenic Drive. After visiting the Lehman Cave interpretive center and viewing the cave, most visitors would continue on up Wheeler Peak Scenic Drive to the Wheeler Peak day use area. This portion of the scenic drive would be upgraded to meet safety requirements and improve access to interpretive pullouts. Road work would be limited to widening shoulders and stabilizing portions of the roadbed.

Wheeler Peak Scenic Drive is wide enough for most vehicles, except car/trailer combinations and RVs more than 30 feet long (overall) and 8 feet wide (mirror to mirror). Because of the potential safety hazards associated with these vehicles, the Park Service would enforce vehicle size restrictions for travel on the scenic drive. A trailer drop-off would be constructed on the north side of the road at Lehman Curve to permit visitors pulling trailers to park them and travel on up the scenic drive. This 1/2-acre paved pull-through parking area would accommodate 20 trailers.

Visitors in oversized RVs would not be permitted past the drop-off point.

Five interpretive pullouts with exhibit panels would be established along this portion of Wheeler Peak Scenic Drive, and some would include trailheads with orientation exhibits for trails leading to representative park features and environments. Campgrounds would also be provided in several locations. All campgrounds in the modern zone would be fenced with timber pole fencing characteristic of the area to separate livestock grazing from camping activities.

Interpretive Pullouts – The first interpretive pullout along this portion of Wheeler Peak Scenic Drive would be the mixed conifer forest/Osceola ditch pullout. Interpretive developments at the existing pullout in this area would be expanded to give visitors a better understanding of these two important features. The 18-mile-long Osceola ditch was constructed in 1889-90 to carry water to the Osceola mining operations. Time and weathering have destroyed the original wood flume sections, and only the graded swath and rotting portions of wood remain in a few locations. A paved 0.1-mile high-standard trail would be constructed through the mixed conifer forest to a place where a portion of the ditch and wooden flume would be rehabilitated. Interpretive exhibits panels along the trail would explain both the mixed conifer life zone and the historic cultural feature. Wheeler Peak Scenic Drive would be slightly realigned in this area to simplify turning movements at the pullout. The parking area on the north side of the road would be restriped to accommodate 5 to 10 cars. A trailhead orientation exhibit would be included in the parking area.

Just beyond the mixed conifer forest/Osceola ditch pullout, an existing informal pullout provides views of a well-developed stand of mountain mahogany with Mt. Moriah in the background. This pullout (the mahogany shrub/Mt. Moriah overlook), also on the north side of the road, would be formalized, and a paved parking area for 5 to 10 cars would be provided. A 1/4-mile wheelchair-accessible trail leading through the mountain mahogany stand to a viewing platform would provide interpretation of this life zone and vegetation type and of the geological and topographic features visible from this area. The 400-square-foot cedar viewing platform would be ramped, with tiered viewing areas to accommodate about 20 visitors. It would provide commanding views of Mt. Moriah, the North Snake Range, and the Snake Valley basin. Interpretation would be provided in exhibit panels. A trailhead orientation exhibit would be included in the parking area. Wheeler Peak Scenic Drive

would be widened along the curve in this area to maximize sight distances in both directions.

The third pullout would be the aspen/Lehman Creek pullout, an existing pullout on the south side of the road that offers expansive views of the Lehman Creek drainage and the upper portion of Wheeler Peak. This pullout would be repaved, and parking would be provided for 5 to 10 cars. A low retaining wall or curbing would be added, and viewing areas would be constructed to enable visitors to look up and down the drainage. Interpretive panels would illustrate themes related to the Lehman Creek drainage, visible geological features, and the basin valley in the distance.

The fourth pullout would be the spruce-fir/Wheeler Peak cirque overlook. Located on the south side of the road, this new pullout would offer magnificent views into the Wheeler Peak cirque. A 5- to 10-car paved parking and viewing area with a retaining wall would be constructed, which would involve roadway widening and extensive fill. Interpretive panels on the retaining wall would focus on the Wheeler Peak cirque and the geologic history that produced it and would also illustrate themes related to the spruce-fir forest community.

The last pullout, the Wheeler Peak pullout, would be associated with the developments described in the "Wheeler Peak Pullout/Tailhead" section. A series of interpretive exhibit panels would describe significant points of interest in surrounding areas, including the bristlecone pine forest, glacier, rock glacier, and other scenic features of the subalpine environment, and would illustrate the life zone theme. This pullout would be the culmination of the tour along the Wheeler Peak Scenic Drive. At the pullout/tailhead, visitors could choose to hike into the adjacent

Wheeler Peak day use area or to return to lower elevation attractions on the scenic drive.

Campgrounds - Two sites along Wheeler Peak Scenic Drive in the Lehman Creek vicinity would be developed for limited-service camping.² A new 50-site campground - the Lehman Flats campground - would be established about 1/2 mile west of the Lehman Cave access road and 1/8 mile south of the scenic drive in an area above the Lehman Creek floodplain. The access road system and vehicle sites in the campground would be paved. An amphitheater would be included, and each site would have a tent pad, picnic table, and fire ring. A water line would be extended from Cave Spring to the campground, and a potable water system and comfort stations with low-volume flush toilets would be installed. Two campsites would be designed for use by disabled visitors and would include barrier-free toilets. A dump station would be designed and located to service all recreation vehicles without interfering with campground traffic flow. One campsite with water, sewer, and electrical hookups would be reserved for the campground host. Hookups would not be provided at other campsites, but electricity would be extended to the amphitheater and toilets.

The second campground would be the existing 24-site limited-service campground at Upper Lehman Creek, which would accommodate small RVs and cars with small trailers. The campsites here would be upgraded and a campfire circle would be established, but there would be no major redesign of the road or campground layout. New vault toilets would be provided. One campsite would be redesigned for disabled visitors, with new barrier-free toilets. Potable water would be available from Cave Spring.

2. Three types of campgrounds would be provided in the park - limited service, rustic, and backcountry. Limited-service campgrounds would all be in the modern subzone and would be accessible on surfaced roads; rustic campgrounds would be in the rural subzone and could be reached on unsurfaced gravel roads; backcountry campgrounds and campsites would be accessible only by foot or horseback. The following facilities would be provided:

limited service	rustic	backcountry
hardened sites	unhardened sites	designated sites
fire rings or grates	fire rings or grates	fire grates where fires allowed
picnic tables	picnic tables	no picnic tables
potable water	no water*	no water*
vault toilets	vault toilets	pit toilets
or low-volume flush toilets		

*Untreated water might be available in nearby streams.

PROPOSED ACTION

The existing Lower Lehman Creek campground would be removed because it is in a sensitive riparian area. The area would be recontoured and revegetated with native species.

Wheeler Peak Pullout/Trailhead. As stated earlier, the Wheeler Peak pullout/trailhead would be the culmination of the tour and the last interpretive stop on the Wheeler Peak Scenic Drive. It would also serve as an origination point for hiking into some of the park's most scenic country, including the bristlecone pine forest, subalpine lakes, glacier, rock glacier, and the summit of Wheeler Peak. A number of facilities would be established or upgraded in this area to interpret the many significant features, to assist visitors in choosing the types of trails and activities suited to their interests, and to support anticipated high levels of use (see the Wheeler Peak Pullout/Trailhead Development Concept Plan).

The existing small parking area on the west side of the road at the summit trailhead would be redesigned, paved, and expanded into a 10-car parking lot. A traffic island would separate parking from the main roadway. Visitors would be able to hike from this trailhead to the summit of Wheeler Peak and also to the Strawberry Creek trail system over a connecting trail along the west flank of Bald Mountain. Orientation exhibits would be placed at the trailhead.

A major pullout (the Wheeler Peak pullout described above) and trailhead would be established approximately 300 feet east of the existing Wheeler Peak trailhead and north of Lehman Creek. A 50-car paved parking area (with space to expand to 75 cars) would be constructed to alleviate problems associated with visitor use in this area. The existing parking lot is undersized and has poor access and inadequate maneuvering space. Many daytime visitors drive into the nearby camping area to park their cars, reducing available parking for campers. The pedestrian crossing from the parking lot to the existing Wheeler Peak cirque trailhead is on a blind corner and is considered dangerous. Random pedestrian circulation is causing environmental damage.

Access to the proposed parking area from Wheeler Peak Scenic Drive would be at a point approximately 300 feet beyond the existing day use parking area. A minimum sight distance of 100 feet in each direction would be maintained at this intersection. The parking area would be built on a site northeast of the existing lot in an open-canopy forest of limber pine, aspen, and spruce. It would include three terraced lots separated by traffic islands planted with subalpine meadow vegetation. The parking area would be

screened from the scenic drive with shrubs and trees native to the subalpine zone.

The main pullout/trailhead and restroom facilities (vault toilets) would be consolidated near the new parking area. These facilities would be wheelchair-accessible, and a seating area would be provided with gathering space for groups. The trailhead would be sited to take advantage of the mountain views to the northwest. A paved trail (with a pedestrian crosswalk across Wheeler Peak Scenic Drive) would link the trailhead to the existing system of day use trails in the semi-primitive day use subzone. A new pedestrian bridge would be constructed over Lehman Creek in this area. The existing parking lot, restroom, and trailhead would be removed, recontoured, and revegetated with native species.

The 37-site limited-service Wheeler Peak campground would be retained. This campground would continue to accommodate cars and small RVs. The campsites would be upgraded, but there would be no major redesign of the road or campground layout. A campfire circle would be included, and two sites would be redesigned for use by disabled visitors, with new barrier-free vault toilets. Potable water would be available.

Administrative Facilities. The plan calls for development of a major administrative site near the town of Baker. Most existing and all proposed operational support facilities would be located at this site. The only facilities that would be maintained in the park are those needed to protect resources and those that contribute to visitor understanding of Great Basin. This action would conform with the 1989 *Management Policies* (chapter 9:14), which state that "management facilities will be located outside park boundaries whenever the management functions being served can be adequately supported from such a location."

An 80-acre site in the town of Baker was chosen as the new location for the administrative offices and maintenance facilities required to support increased visitation and associated operating activities and for all housing except that needed to establish a presence in the Lehman Cave area. Development on this site would accomplish several objectives. It would establish an NPS presence in the community of Baker, which would foster improved working relationships and social ties between Park Service staff and local residents. In addition, the town of Baker is currently examining facilities for water and sewage treatment, and it is possible that the Park Service and the town could build a

combined treatment system rather than duplicating systems. Improved treatment systems might increase opportunities for economic development in the town.

The proposed 80-acre Baker site is on the east side of Highway 487 approximately 300 yards north of its intersection with Highway 488 (the existing park entrance road). This site was transferred from the Forest Service to the Park Service as part of the Department of the Interior Appropriations Act of 1991, to be administered as a detached administrative area. The site is a flat expanse of land, with little vegetation except a few cottonwood trees. During the summer, temperatures at the site can reach 115 degrees – an average of 5 to 10 degrees hotter than temperatures at the Lehman Cave interpretive center. However, with some modifications to site conditions (irrigation, planting of shade trees, and creation of greenspace), the microclimate here could be modified to make it a pleasant place to live and work. All buildings would be air-conditioned and sited to maximize solar efficiency.

Initially, the Baker site would have three components – a 3,000-square-foot administrative facility, a 5-acre maintenance compound, and a residential area with six single-family units and 20 to 30 apartment units. The Park Service would prepare a development concept plan for the Baker property before construction was initiated.

The new administration building would include office space for the superintendent, administrative staff, division chiefs, and protection and resource management personnel; two conference rooms; a library; a small laboratory; curatorial and records storage space, other NPS storage space, and natural history association storage space; restrooms; and a lobby. Two interpretive staff offices would be retained at the Lehman Cave interpretive center to support staff needs there, and a superintendent's office/conference room, interpretive workroom, and protection staff office would be provided at the new Great Basin visitor center.

All present maintenance functions would be relocated from the park to the new 5-acre maintenance compound. The compound would include a 2,500-square-foot building with office space, a planning and break room, a paint room, and plumbing, electrical, and carpentry shops; a 10,000-square-foot vehicle storage building with automotive and heavy equipment service bays and a welding and machine shop; and a 3,000-square-foot warehouse with heated and unheated space for materials and flammables

storage. The compound would also include outdoor storage, a boneyard, a hazardous materials storage area, and a 500-square-foot fire cache. The entire site would be landscaped with berms and vegetation that incorporate fencing to provide security and visual screening from nearby residential areas. Only one maintenance structure would remain in the park, in the Lehman Cave area; it would house the existing fire cache, fire truck, and emergency generator. The other buildings in the maintenance area would be removed, and their sites recontoured and revegetated.

Six new single-family housing units and 20 to 30 apartment units would be constructed at the 80-acre Baker site to meet the projected park housing needs in the next 10 years. Four housing trailers in the park would be removed, in keeping with the 1989 *Management Policies* directive (chapter 9.15) that "trailer homes may not be purchased for use as housing in parks, except for short term temporary use," and replacement housing would be provided at the Baker site. The remaining nine housing units in the park would not be removed until they were no longer functional. Nonfunctional permanent housing would be replaced by housing at the 80-acre Baker site, except for the few housing units determined essential for in-park security and emergency response. As houses within the park were removed, the Park Service would recontour and revegetate the disturbed sites.

All new housing would be low-profile and designed to enhance views toward the park and nearby mountain ranges. Because there are few facilities in Baker for social and recreational functions, a community playground would be built near the housing area. To mitigate the effects of the summer heat, all structures would have central air conditioning and be sited to maximize the warming effects of winter sun and minimize the heating effects of summer sun. The housing area would be carefully designed and laid out in relation to other proposed facilities to make it a pleasant living environment for both permanent and seasonal employees. Landscaping would be a central part of the design and would include shade trees, turf, and vegetated berms that would serve as windbreaks.

The existing sewage treatment ponds in the park are inadequate to handle the demands of increasing visitation and necessary support services. In cooperation with the state of Nevada and the town of Baker, the Park Service would develop a new sewage treatment plant in the Baker vicinity. Funding for construction and operational costs might

Summit Trailhead

- Redesign trailhead to accommodate 10-car paved parking area

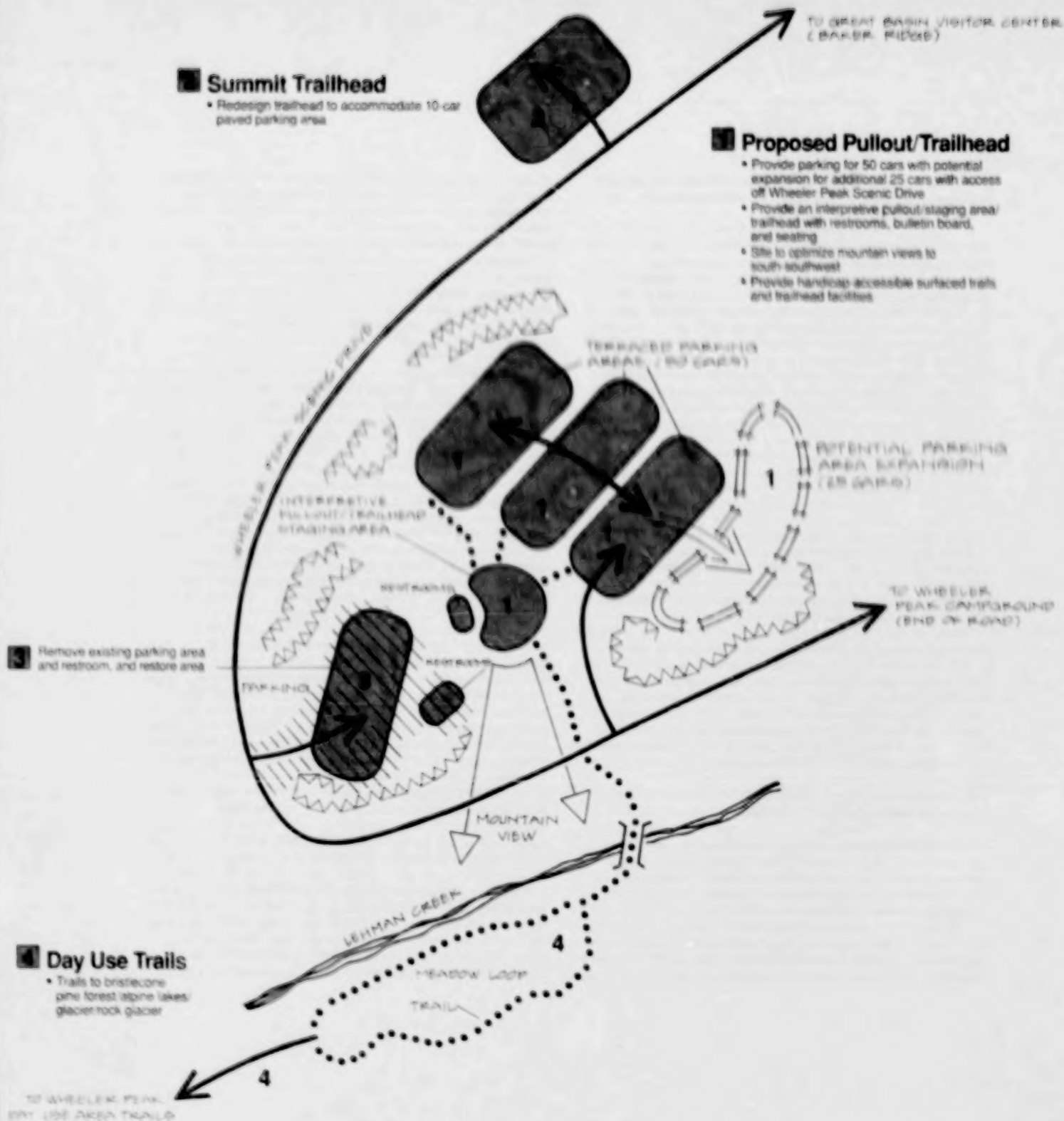
Proposed Pullout/Trailhead

- Provide parking for 50 cars with potential expansion for additional 25 cars with access off Wheeler Peak Scenic Drive
- Provide an interpretive pullout/staging area/trailhead with restrooms, bulletin board, and seating
- Site to optimize mountain views to south-southwest
- Provide handicap-accessible surfaced trails and trailhead facilities

- Remove existing parking area and restroom, and restore area

Day Use Trails

- Trails to bristlecone pine forest/alpine lakes/glacier/rock glacier



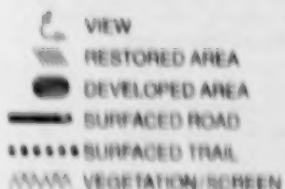
DEVELOPMENT CONCEPT PLAN WHEELER PEAK PULLOUT/TRAILHEAD

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Visitor Use and Development



be shared between the state and federal government to provide a facility that would serve both the needs of the park and the community of Baker. A new wastewater system would be developed to carry effluent from the new Great Basin visitor center and Lehman Cave facilities, the housing area in the park, and the Lehman Flats campground to the proposed sewage treatment plant in the Baker vicinity. The existing park sewage treatment ponds would be removed following construction of the new treatment facility. The gravel access road to the ponds would be removed and restored to natural conditions.

In cooperation with the state of Nevada and the town of Baker, the Park Service would drill a water well or wells in the Baker vicinity to provide water for the Baker site. Funding and operational costs might be shared by the state and federal government to build a facility and distribution system to provide water to both the park and the community of Baker.

An additional 100,000-gallon water tank would be installed within the park at Cave Spring to provide for increased water needs at the Great Basin visitor center, Lehman Cave interpretive center, campgrounds, and park housing area. This would double the existing storage capacity to 200,000 gallons, providing a greater peaking capacity for the water supply to meet anticipated demands. The existing access road to the water storage tanks would be retained.

Water, electricity, and sewage lines would be extended below ground from the proposed sewage treatment facility in the Baker vicinity to the facilities at the 80-acre Baker site (orientation center, administration building, maintenance compound, and housing area). Within the park, water, sewage, and electricity lines would be extended below ground from the existing Lehman Cave development to the new cave ticket sales kiosk and restroom, the Great Basin visitor center, and the Lehman Flats campground.

The rural subzone would be accessible by two-wheel-drive or four-wheel-drive vehicles along designated gravel access roads. It would provide rustic camping areas and trailhead access into the park's semi-primitive and primitive subzones. The rural subzone would include the upgraded unsurfaced roads leading into the Strawberry Creek area in the northernmost part of the park and along the eastern park boundary at Snake Creek, Big Wash, and Lexington Arch. Small areas in the southern and southwestern sections of the park including Big Spring Wash, Highland Ridge, and

Rural
Subzone

PROPOSED ACTION

Decathlon Canyon would also be included in this subzone. No off-road vehicle use would be permitted in rural areas.

From a visitor's perspective the rural subzone would bridge the gap between frontcountry and backcountry use. Although easily accessible, it would offer a greater degree of solitude and an escape from the heavily used areas in the modern subzone. For those planning more demanding hiking, backpacking, or horseback riding experiences, the rural subzone would provide "base camps" for such excursions.

Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch would be accessible by gravel roads on NPS rights-of-way (BLM and Forest Service roads would provide four-wheel drive access to Big Spring Wash and Highland Ridge). These four areas would have trailhead parking, and some would include rustic campsites, campgrounds, and horse corrals. Campsites and campgrounds would include picnic tables, fire grates, and vault toilets. Campsites would be surfaced with crushed limestone to reduce washout and provide site identification, and they would have some type of perimeter definition to limit damage to the surrounding environment (for example, edging materials such as recessed timbers, sensitively placed rocks, or other materials that would encourage visitors to limit their activities to the defined area). Corrals would be constructed of timber poles and include water troughs and primitive mangers for hay and feed.

Interpretive media in the rural subzone would be limited to information shelters in campgrounds, orientation exhibits at trailheads, and interpretive exhibit panels and signs at other selected locations. Campground shelters would provide general parkwide orientation, detailed orientation to the campground and immediate vicinity, and space for posting information of interest to visitors. Trailhead orientation exhibits would provide the information needed to plan safe, enjoyable, and educational hiking and horseback riding experiences.

The Park Service would obtain rights-of-way from the Bureau of Land Management and Forest Service for access along the Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch approach roads to the park boundary. The rights-of-way would extend 200 feet on each side of the road centerline. The Park Service would be responsible for upgrading and maintaining these roads.

Strawberry Creek. Strawberry Creek has traditionally been used by visitors from the Great Basin region who enjoy

rustic car camping experiences. These types of experiences would be maintained by designating and providing perimeter definition at the seven existing rustic campsites along Strawberry Creek. Each campsite would have a picnic table, fire grate, and vault toilet. The campsites would not be fenced from livestock grazing.

A new rustic group campground would be established at the west end of Strawberry Creek. It would include six picnic tables, six fire grates, and two vault toilets as well as a 10-car gravel parking area, a corral, and a trailhead providing access to Upper Strawberry Creek, Windy Canyon, Blue Canyon, and the northern portion of the Osceola ditch trail (the Osceola tunnel interpretive trail). An information shelter would be installed in the campground, and an orientation exhibit at the trailhead. A separate 10-car gravel parking area and trailhead would be constructed in the Strawberry Creek area to provide access to the southern portion of the Osceola ditch trail for hikers only. All of the trails in the Strawberry Creek vicinity would be in the semi-primitive subzone. Horseback riding in this section of the park would be confined to Strawberry Creek, Windy Canyon, Blue Canyon, and the Osceola tunnel interpretive trail.

The 6-mile access road into the Strawberry Creek area would be upgraded from dirt to two-wheel-drive gravel from US 630.

Snake Creek. Snake Creek is another area that has traditionally been used by people who prefer rustic camping. Ten rustic campsites would be designated along the creek, and each would have perimeter definition, a picnic table, a fire grate, and a vault toilet. The campsites would not be fenced.

A new six-site rustic cluster campground would be developed at the Shoshone campground at the west end of Snake Creek. Off-road parking and walk-in campsites would be provided. The campsites would have defined perimeters, and six picnic tables, six fire grates, and two vault toilets would be included.

The Johnson Lake and Dead Lake trailheads would be redesigned, and each would include 10-car gravel parking and an orientation exhibit. A corral would be constructed at the Johnson Lake trailhead. These trailheads would provide access to the Baker Lake trail system.

The 12-mile dirt access road into the Snake Creek area would be upgraded to a gravel two-wheel-drive road from Highway 487.

Big Wash. The proposed Big Wash trailhead would be on Forest Service right-of-way land about a mile east of the park boundary where the access road ends and the existing trail begins its descent into the wash. The Park Service would establish a cooperative agreement with the Forest Service for use of this land and would develop a 10-car gravel parking area, a corral, and a trailhead with an orientation exhibit. Hikers and horseback riders would be able to reach the southern portion of the park from this trailhead. Trailhead development would be contingent upon the Park Service obtaining an easement for the portion of the trail that crosses private land before it reaches the park boundary (see the "Semi-Primitive Subzone, Big Wash" section).

The 9-mile Big Wash access road would be upgraded and maintained by the Park Service as a two-wheel-drive gravel road from Utah Highway 21.

Lexington Arch. Lexington Arch is a natural limestone bridge in the extreme southeastern part of the park that is proposed as a day use destination. The existing 11-mile dirt entry road would be upgraded and maintained by the Park Service as a two-wheel-drive gravel road, and a 10-car gravel parking area and Lexington Arch trailhead would be developed 0.8 mile east of the park boundary through a cooperative agreement with the Forest Service. An orientation exhibit would be included at the trailhead.

Big Spring Wash and Highland Ridge. Access to these two remote areas in the southern part of the park would be by four-wheel-drive vehicle along BLM and Forest Service roads. The Park Service would provide informal parking, trailhead orientation, and corrals at access points within the park boundary.

The road through Decathlon Canyon crosses the extreme southwestern boundary of the park. This portion of the unmaintained road would remain open to backcountry users traveling to Highland Ridge and to hunters wishing access to Forest Service lands farther up the canyon.

The roadless semi-primitive day use subzone would provide opportunities to view significant park features in a largely natural setting. Trails would permit access to such prime natural resources as subalpine lakes, a bristlecone pine

forest, a permanent glacier, a rock glacier, and a large limestone arch. Visitors could take ranger-guided interpretive walks or explore these areas on self-guiding interpretive trails of varying degrees of difficulty.

To protect sensitive resources, only hiking and picnicking would be permitted in this subzone. Horseback riding, camping, and open fires would be prohibited. In addition, because use would be relatively high in this subzone and visitors would be able to view and study many of the resources that the park was established to preserve, grazing would be prohibited to ensure quality visitor experiences and protection from the hazards associated with human-livestock contacts. Facilities in this subzone would be limited to unstaffed interpretive kiosks, interpretive exhibit panels, and low-profile directional and safety signs. Publications about the park's features and life zones would also be available.

The existing and proposed trails in the semi-primitive day use subzone are shown on the Trails - Proposed Action map in the "Semi-Primitive Subzone" section.

Wheeler Peak Day Use Area. Access into the Wheeler Peak day use area would be provided at the summit and Wheeler Peak trailheads. In addition, a trail through the semi-primitive subzone would connect the Upper Lehman Creek campground with this area. Trails in the day use area would lead to the bristlecone pine forest, the three subalpine lakes, the glacier and rock glacier, and the top of Wheeler Peak. This area would be heavily used and would require continuing maintenance and resource protection activities. Approximately 1.5 miles of the existing trails would be rehabilitated, 3.1 would be reconstructed, and 0.9 would be maintained in this area, and one new 0.1-mile trail would be constructed.

Bald Mountain Cutoff Trail (0.9 mile) - This gently sloping trail begins at the Wheeler Peak trailhead and links with the Wheeler Peak trail. It is in satisfactory condition and would be maintained.

Alpine Lakes Loop Trail (0.6 mile) - This moderately sloping trail is accessible from the Wheeler Peak trailhead. It winds through a spruce forest to Stella and Teresa lakes. The trail would be rehabilitated and converted to a hard-surfaced interpretive trail using crushed granite, limestone, or similar materials. New exhibit panels along the trail would interpret the more significant aspects of the subalpine environment.

Semi-Primitive
Day Use
Subzone

Bristlecone/Glacier Trail (1.0 mile) - This trail begins at the Teresa Lake juncture and leads to the bristlecone forest, rock glacier, and glacier. Fairly steep slopes and rocky scree require moderately strenuous hiking. The trail would require both rehabilitation and reconstruction. It would be hardened using crushed granite, limestone, or similar materials from Teresa Lake through the bristlecone forest, and a cairn-marked earth or rock-surfaced trail would lead from the bristlecone pine forest to the rock glacier and glacier. New exhibit panels would be provided along this trail, dealing with the natural history and life cycle of bristlecone pines. A self-guiding publication would interpret the rock glacier and glacier portions of the trail.

Wheeler Peak Trail (2.0 miles) - This steep trail leads from the Wheeler Peak trailhead to Stella Lake and the summit of 13,365-foot Wheeler Peak. The trail would be rehabilitated and reconstructed to establish a cairn-marked unsurfaced trail, which would be interpreted through self-guiding publications.

Wheeler Peak Meadow Loop Trail (0.1 mile) - A new barrier-free paved/boardwalk trail would be built through the spruce-fir, aspen, and remnant meadow margin next to the Wheeler Peak parking area. This trail would have secluded places where people could sit, birdwatch, and enjoy the scenery. Exhibit panels would provide interpretation of natural resources visible along the trail route.

Lexington Arch Day Use Area. The Lexington Arch natural limestone bridge is the most visited feature in the southern part of the park. The 1.0-mile trail leading from the parking area to Lexington Arch and a 1/4-mile area including and surrounding the arch would be designated semi-primitive day use to protect this natural feature. The trail, which winds through a riparian area to the arch, would be reconstructed and upgraded to an unhardened hiking trail to accommodate increasing levels of use. Exhibit panels would be developed to interpret Lexington Arch, focusing on its geologic origins and physical dimensions.

Semi-Primitive Subzone

The semi-primitive subzone would contain most of the park's established backcountry trails and would provide access to some of its most scenic backcountry areas. This subzone would attract visitors seeking to explore the more remote areas of the park with some direction provided. Well-marked hiking and equestrian trails would permit people to travel from the park's northernmost to southernmost reaches.

self-guiding publications would provide interpretation for all of the trails in the backcountry system. The semi-primitive subzone would be entirely roadless, and developments would be limited to low-profile directional and safety signs and a few designated campsites with pit toilets and fire rings.

The proposed semi-primitive trail system would include a total of 77.5 miles of trails. It would incorporate 53.9 miles of existing backcountry trails in the Strawberry Creek, Lehman Creek, Baker Lake/Johnson Lake, Kioux Basin, and Big Wash areas as well as many old jeep trails and tracks that extend from the boundary into the park's canyons and high country. Approximately 11.5 miles of the existing trails would be rehabilitated and 42.4 miles would be reconstructed, as proposed in the 1989 backcountry trails study and described in the introduction to the "Visitor Use and Development" section. In addition, seven new trail segments totaling 23.4 miles would be constructed to link existing trails, tracks, and interpretive features, and five or six backcountry camping areas would be designated. Following is a brief description of the existing park trails, from north to south, and the actions recommended for them. The trails are shown on the Trails - Proposed Action map.

Strawberry Creek. Existing trails in the Strawberry Creek area provide access into the northern portions of the park's backcountry. A proposed trailhead at the west end of the creek would provide access for hikers and horseback riders to Upper Strawberry Creek, Windy Canyon, Blue Canyon, and the Osceola tunnel interpretive trail (the tunnel interpretive trail is described in the "Proposed Trails" section below). A second trailhead would provide hiking access to the portion of the Osceola ditch that winds south and east from Strawberry Creek. The existing Strawberry Creek trails would be rehabilitated or reconstructed.

Lehman Creek. The Lehman Creek trail extends from the trailhead at the Upper Lehman Creek campground to the Wheeler Peak trailhead. This moderately steep trail follows the course of Lehman Creek and is available for hiking and horseback riding. It would be reconstructed.

Baker Lake. The Baker Lake trail system is accessible from the Baker Lake trailhead at the end of the Baker Creek road and from the Shoshone campground trailhead in Snake Creek. It is a loop trail system for hikers, with a return by way of Johnson Lake. Features along the trail system include Baker Lake, Pyramid Peak, Johnson Lake, and mining relics and moldering cabins long since abandoned by early settlers. Portions of the loop follow Baker Creek and

Timber Creek and in areas above timberline afford distant views of the basins and ranges outside the park. This trail system would also be upgraded and improved.

To provide for horseback riding in this area, a corral would be placed within reasonable walking distance of Baker Lake. Because of the sensitivity of fragile subalpine resources in the vicinity, horses would not be allowed near the lake proper. For the same reason, horseback riders would have to enter and return from the Baker Lake area on the same trail, as they would not be permitted to continue on past the Baker Lake cutoff to Johnson Lake.

Kious Basin. This trail system, composed largely of old jeep trails and tracks, begins at the Kious Basin trailhead parking area and runs up moderately steep terrain into the basin. From there one trail extends southeast along the hillside to Young Canyon, Rudolph Canyon, and Mahogany Spring, and the other goes northwest to Can Young Canyon and the Grey Cliffs campground and corral. These trails would be designated for both hiking and horseback riding. Self-guiding publications would interpret the area's unique geology, vegetation, and scenery. The trails would be upgraded, but would remain dirt-surfaced. They would all be within the present park boundary.

An old four-wheel-drive trail extends across two sections of Forest Service land just outside the eastern park boundary, connecting the northwest Kious Basin trail segment with the proposed Great Basin visitor center site at Baker Ridge. These two sections are recommended for transfer to the Park Service under the proposed action. If the 1.2-mile segment of the trail on Forest Service land was transferred to NPS jurisdiction, a new trail link would be established there.

Snake Creek. Two existing jeep trails lead from the vicinity of the Shoshone campground to points of interest such as Johnson Lake and Dead Lake. A third trail leads to the ridge to the south of Snake Creek. These three trails, which are currently closed to vehicle use, would receive major reconstruction or would be relocated to be maintainable as hiking and horseback riding trails.

Big Wash. The trail along the North Fork of Big Wash is washed out and barely discernible in some locations. It was a four-wheel-drive route that traversed the park east-west and exited south of the Mt. Washington summit. The South Fork trail, which is maintained, leads to a mine north of Lexington Arch. These trails are currently closed to

four-wheel-drive use. The North Fork trail would be reconstructed or relocated to improve its condition.

A portion of the access trail from the proposed Big Wash trailhead to the park boundary crosses private land. The Park Service would seek to acquire an easement for that portion of the trail tread from the owner of the property. When the easement was acquired, trail improvements would be made.

Proposed Trails. The following new trails would be constructed in the semi-primitive subzone to link existing trails and provide north-south access through the park.

Strawberry Creek/Wheeler Peak (4.7 miles) – This trail would make it possible to hike from Strawberry Creek to the summit of Wheeler Peak. The trail would pass through mixed conifer forest along the western escarpment of Bald Mountain and would provide sweeping views of Spring Valley.

Lehman Creek/Baker Creek (3.1 miles) – This trail would provide hiking access between Upper Lehman Creek campground and Baker Lake trailhead. The trail would traverse pinyon-juniper forest on the slopes to the west of Lehman Cave.

Pole Canyon/Baker Creek (1.6 miles) – This trail would link the Kious Basin trail system with the Baker Lake trail system, making it possible to hike from the Kious Basin trailhead to the Baker Creek loop. The trail would traverse pinyon-juniper forest from the upper reaches of Pole Canyon to Timber creek.

North Fork of Big Wash/Snake Creek (2.1 miles) – This trail segment would link the Shoshone trailhead to the North Fork of Big Wash. It would cross rugged terrain in mixed conifer forest.

Big Spring Wash/Lexington Arch (5.2 miles) – This trail would link the Big Spring Wash trailhead with an extensive system of trails in the southern portion of the park. It would cross moderately sloping terrain in an aspen/mountain mahogany forest.

South Fork of Big Wash/Highland Ridge (5.7 miles) – This trail would link the Highland Ridge trailhead to Big Wash Canyon. It would traverse mixed conifer forest.

A detailed map of the Grand Staircase-Escalante National Monument, showing 32 numbered trailheads. The map is enclosed in a dashed boundary line. Key features include:

- Trailheads (Numbered 1-32):**
 - 1: Wheeler Peak
 - 2: Wheeler Peak
 - 3: Wheeler Peak
 - 4: Wheeler Peak
 - 5: Upper Lehman Creek
 - 6: Baker Lake
 - 7: Baker Lake
 - 8: Lexington Arch
 - 9: Baker Lake
 - 10: Johnson Lake
 - 11: Johnson Lake
 - 12: Johnson Lake
 - 13: Dead Lake
 - 14: Big Spring Wash
 - 15: Johnson Lake
 - 16: Great Basin
 - 17: Johnson Lake
 - 18: Lexington Arch
 - 19: Occoola Tunnel
 - 20: Strawberry Creek
 - 21: Great Basin
 - 22: Kiosk Basin
 - 23: Great Basin
 - 24: Big Spring Wash
 - 25: Wheeler Peak
 - 26: Baker Lake
 - 27: Baker Lake
 - 28: Johnson Lake
 - 29: Johnson Lake
 - 30: Highland Ridge
 - 31: Strawberry Creek
 - 32: Occoola Tunnel
- Geographical Features:**
 - Occoola Tunnel
 - Strawberry Creek Trailhead
 - Upper Lehman Creek Trailhead
 - Wheeler Peak Trailhead
 - Wheeler Peak
 - Baker Lake Trailhead
 - Baker Lake
 - Baker Lake Cut-off
 - Johnson Lake
 - Dead Lake
 - Dead Lake Trailhead
 - Johnson Lake Trailhead
 - Mustang Spring
 - Highland Ridge Trailhead
 - Big Spring Wash Trailhead
 - Lexington Arch Trailhead
 - Great Basin Visitor Center Trailhead
 - Kiosk Basin Trailhead

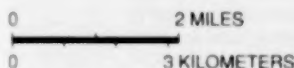
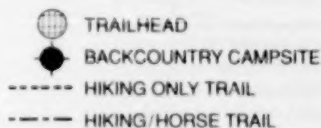
BIG SPRING WASH
TRAILHEAD

TRAILS PROPOSED ACTION GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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Visitor Use and Development



Proposal			
Existing, Reconstructed, or Rehabilitated Trails	Miles	Needing Reconstruction	Needing Rehabilitation
1 Alpine Lakes Loop Trail	0.5	0.0	0.6
2 Bristlecone Ice Field	1.0	0.5	0.5
3 Wheeler Peak Trail	2.0	1.6	0.4
4 Bald Mountain Cutoff Trail	0.9	0.0	0.0
5 Lehman Cr. Trail	3.2	1.5	1.7
6 South Fork Baker Creek Trail	1.6	0.8	0.8
7 Timber Creek Trail	2.2	2.2	
8 Lexington Arch Trail	1.0	1.0	0.0
9 Baker Lake Trail	4.7	0.0	4.7
10 Johnson - Baker Lake Trail	1.4	1.4	
11 Johnson Lake Trail	3.3	2.1	1.2
12 Snake Creek Divide Trail	0.6	0.6	
13 Dead Lake Trail	1.7	1.7	
14 South Fork of Big Wash Trail	3.8	0.7	3.1
15 North Fork of Big Wash Trail	12.3	12.3	
16 Lehman Nature Trail	0.1	0.0	
17 Shoshone Trail	1.0	1.0	
18 Osceola Ditch Trail	5.9	5.9	
19 Upper Strawberry Creek Trail	2.3	2.3	
20 Osceola Interpretive Trail	0.1	0.1	
21 Pole Canyon Trail	3.2	3.2	
22 Kioux Trail Group	6.6	6.6	
23 Old Baker Creek Trail	0.8	0.8	
Totals	60.3	46.3	
Proposed New Trails	Miles		
24 Meadow Loop Trail (Wheeler Peak Area)	0.1		
25 Strawberry Cr. - Wheeler Peak Link	4.7		
26 Lehman Creek - Baker Creek Link	3.1		
27 Pole Canyon - Baker Cr. Link	1.6		
28 N. Fk. Big Wash - Snake Cr. Link	2.1		
29 Big Spring Wash - Lexington Arch Link	5.2		
30 South Fork of Big Wash Trail	5.7		
31 Mahogany Shrub/Mt. Moriah Trail	0.2		
32 Osceola Tunnel Nature Trail	1.0		
Total	23.7		

Osceola Tunnel Nature Trail (1.0 mile) - This trail would extend from a trailhead in Strawberry Creek along a segment of the Osceola ditch to the Osceola tunnel. Self-guiding publications would be developed to interpret tunnel construction and engineering, water diversion, and the history of the site.

Backcountry Camps. Five or six backcountry camps would be designated: one at Johnson Lake, one at Baker Lake, one below Baker Lake (with a corral), one at Timber Creek, and one or two at as-yet-unspecified areas. They would have tent pads with perimeter definition and would be sited to avoid sensitive resources. Wood fires would be prohibited in alpine and subalpine areas. If camping demand exceeded the number of campsites, the park would issue overnight camping permits for some of these areas to regulate use.

On-site interpretive developments in the semi-primitive subzone would be limited to low-profile directional, safety, and resource protection signs. A backcountry trail guide would be developed to provide information about and interpretation of the resources associated with backcountry trails. Depending on the depth of interpretation to be provided, this might be a single publication or several smaller guides. The trail guide(s) would include route maps, safety information, and interpretation of specific features such as bristlecone pines, alpine vegetation, and abandoned mining operations.

This subzone, which would include large areas in the central and southern parts of the park, would remain essentially free of human influence. There would be no roads, no established or maintained trails, and no visitor facilities. Visitors would travel on foot into this subzone and would rely on orienteering skills to explore and discover the park's backcountry. Camping would be permitted, but no campsites would be designated and no campfires would be allowed. Orientation and interpretive media would be limited to backcountry trail guides, maps, and other carry-along materials. This subzone would attract people seeking solitude and challenge.

Primitive
Subzone

The Mt. Washington access road, which leads into the primitive subzone on the west side of the park, would be gated at the boundary, and no public vehicular access would be provided beyond this point.

PROPOSED ACTION

Research Natural Area and Protected Natural Area Subzones

The research and protected natural area subzones would be managed the same as the primitive subzone except that grazing would be prohibited to protect sensitive alpine plant species. The research natural area subzone would include the magnificent stand of bristlecones pines in the southwestern part of the park. The protected natural area subzone would encompass large areas of fragile alpine tundra. Management actions in both of these subzones would focus on resource protection and monitoring. No roads or other developments, except low-standard trails, would be allowed. Visitor experiences in these areas would be similar to those in the primitive subzone, except that camping would be prohibited.

Special Use Zone

The special use zone would continue to contain the few facilities within the park boundary that are operated and maintained by interests other than the Park Service. These include a 30-foot-high television relay tower and associated concrete structure near Cedar Spur (in the east-central part of the park) operated by the White Pine Television District and the radio repeater on Bald Mountain operated by the Forest Service through an informal agreement with the Park Service. With Park Service permission, Forest Service personnel hike or helicopter into the repeater site.

Limits of Acceptable Change Program

The park would implement a *limits of acceptable change* (LAC) program in which park staff would identify desired resource conditions and use levels within the various subzones of the park and would implement actions to achieve those conditions. After actions were implemented, the program would focus on monitoring activities and conditions in areas of heaviest use (in the modern, rural, and semi-primitive day use subzones) as well as backcountry use in the semi-primitive and primitive subzones. If monitoring indicated a need, the use level for a given subzone might be adjusted.

Although the park staff would identify most of the desired park conditions through the LAC program, the proposed action recommends actions that would achieve or sustain desired conditions or levels of activity in specific locations. At Lehman Cave, the daily capacity would not exceed the desired condition of 20 tours of 30 people, or 600 people per day, and only guided tours would be provided. As stated earlier, the size of Lehman Cave (narrow chambers and low ceilings) and the number of delicate features within easy reach of visitors preclude a self-guiding tour option for the cave. Unless research indicated otherwise, guided tours would be continued and the cave capacity of 600 people per day would not be exceeded. To accommodate the desired

number of visitors at the cave and to eliminate the overflow parking that occurs along the access road on peak days, parking space at Lehman Cave would be expanded to 100 vehicles, and the parking lot would be relocated away from the interpretive center. This action would also reduce the impacts of the existing parking lot on visitors' views of the Snake Valley basin from the Lehman Cave interpretive center. The 100-vehicle capacity would not be exceeded.

The proposed action also sets the following desired limits for other parking areas and campgrounds in the park.

The desired initial limit of the new Great Basin visitor center parking area would not exceed 50 vehicles. This would accommodate existing demand (average 1989 weekend demand). Any additional parking beyond the initial development would not exceed a total of 75 vehicles.

The desired initial limit for the Wheeler Peak pullout/trailhead parking area would not exceed 50 vehicles, which would also accommodate existing demand. Expansion of existing parking to 50 vehicles would reduce the overflow roadside parking that occurs on many weekdays and most weekend days. Any additional parking beyond the initial development would not exceed a 75-vehicle total because of the sensitive nature of the resources at this site and the lack of suitable land for parking expansion. If the parking demands in this area exceeded the 75-vehicle capacity and it was determined through the LAC process that the resources could sustain additional use, some form of shuttle transportation would be implemented. If the LAC process determined that the area could not sustain additional use, the numbers of visitors would be restricted.

The desired limit for the parking areas associated with the Wheeler Peak Scenic Drive interpretive pullouts would not exceed 10 vehicles each (except for the park entrance and Kiowas Basin pullouts). This expanded parking capacity would accommodate existing demand and reduce the overflow parking that occurs during average use periods. However, even with the expanded parking areas, some pullouts could reach capacity during peak holiday weekends, requiring visitors to continue on to other pullouts or activities. Although the pullout parking areas would be slightly larger and more formalized than existing areas, the net effect of the proposals is expected to be an improvement rather than a deterioration in both resource conditions and visitor experiences.

The desired limit for campsites in the park would not exceed 180 sites, including group campsites. Most of the existing 119 campsites within the park are on the gentler slopes along stream corridors in the Strawberry, Lehman, Baker, and Snake creek areas. To limit impacts on these riparian areas – which have been identified as having exceptional resource value – and to avoid impacts associated with development on hillsides and steep slopes, the number of campsites in the park would be increased by no more than 40 percent. At present, campground capacity is exceeded on an average of 12 to 15 weekends between mid-April and mid-October. Even with a 40 percent increase in the number of campsites, this capacity could fall short of meeting demands. To provide for the camping needs of Great Basin visitors, the Park Service would cooperate with and encourage the private sector to provide camping facilities outside the park. The development of such facilities would also likely contribute to the local economy.

**Access for
the Disabled
and Elderly**

Under the proposed action, barrier-free facilities would be provided at the following locations along Wheeler Peak Scenic Drive: the park entrance pullout, desert shrub pullout, Kious Basin pullout, riparian shrub pullout, contemporary ranching pullout, pinyon/juniper pullout, mahogany shrub/Mt. Moriah overlook, aspen/Lehman Creek pullout, spruce fir/Wheeler Peak cirque overlook, and the Wheeler Peak pullout/trailhead. Other new wheelchair-accessible facilities would include the Great Basin visitor center on Baker Ridge, the orientation center and administration building in Baker, the trail between the Lehman Cave ticket sales kiosk and interpretive center and the front entrance to the interpretive center, the paved interpretive trail and viewing platform at the mahogany shrub/Mt. Moriah pullout, the paved meadow loop trail adjacent to the Wheeler Peak trailhead, two campsites at the Lehman Flats campground, one campsite each at the Baker Creek and Upper Lehman Creek campgrounds, and two campsites at the Wheeler Peak campground.

The park maintenance division would undertake minor accessibility improvements (better signing, curb cuts, parking space striping, ramps, and restroom alterations) throughout the park. Any new visitor or employee facilities and any modifications to existing facilities would comply with pertinent laws and regulations, including the Architectural Barriers Act of 1968 (42 USC 4151 et seq.) and the Rehabilitation Act of 1973 (29 USC 792 et seq.). Where possible, the Park Service would provide facilities and interpretive programs for sensory- and learning-impaired visitors. Information on the locations of accessible facilities and programs would be

furnished at the Baker orientation center and Great Basin visitor center.

A relatively small concession would continue to operate in the Lehman Cave interpretive center. The concession would provide limited food service and souvenir sales.

**Concession
Services**

Commercial use licenses would continue to be issued for tour group operators. Additional commercial use licenses might be issued for vehicle towing and road service, supplying firewood to campgrounds, backcountry horse trips, or other activities to serve park visitors. These commercial use licenses would not be limited in number but would be issued on a case-by-case basis.

Great Basin National Park comprises only a portion of the much larger ecosystem centered around the South Snake Range. The park would be managed as an integral part of this larger ecosystem, and full consideration would be given to the potential effects of actions inside and beyond park boundaries. The Park Service would work closely with the Forest Service, Bureau of Land Management, state and local governmental bodies, and adjacent private landowners to manage this ecosystem to maintain the greatest degree of biological diversity and ecosystem integrity within the provisions of the enabling legislation. Park staff would continue to inventory the extent of plant and animal diversity and to identify forces that might affect that diversity. Endangered and sensitive species would be protected and, where possible, restored to their natural ranges.

**NATURAL
RESOURCE
MANAGEMENT**

The Park Service would strive to maintain the highest degree of integrity of the air, water, biological, and geological resources in the park by establishing a resource baseline to determine the present condition of these resources, monitoring changes to resource conditions, and identifying and, if possible, mitigating the sources of changes. Scientific research in the park would be encouraged to increase knowledge about the natural processes, objects, and organisms present.

The park is and to a lesser degree would continue to be adversely affected by domestic livestock grazing and mining. It is also susceptible to major environmental factors such as global warming, regional acid rain deposition, and radiation fallout over which the Park Service has little control.

**Man-Caused
Influences
on Natural
Resources**

Domestic Livestock Grazing. As indicated in the "Planning Issues and Concerns" section, the continuation of domestic livestock grazing within the park is a complex issue. The

PROPOSED ACTION

authorizing legislation (sec. 3(e)) states that grazing will be permitted to the same extent as was permitted on July 1, 1985, but it prefaces that authorization by stating that grazing will be subject to such limitations, conditions, or regulations as the secretary of the interior may prescribe. In addition, section 3(f) provides for negotiations between the grazing permittees and the Park Service for the exchange of all or part of their grazing allotments for allotments outside the park. The Park Service would develop and use various sound range management techniques, consistent with NPS policies and guidelines, to minimize grazing's adverse effects on exceptional resources such as riparian areas and rare and sensitive plant species.

In the foreseeable future, grazing would continue in the park, except in the semi-primitive day use, protected natural area, and research natural area subzones. In general, these subzones contain many sensitive species but very little available forage and are thus poorly suited for grazing. Exceptions are the drainages of Pine and Ridge creeks, which are at lower elevations and are currently grazed by domestic sheep. In these subzones, domestic livestock would only be permitted where it was necessary to move them from one area of an allotment to another or to provide them with access to water. The allotment management plans would specify stock driveways and water sources that could be used in these subzones.

Grazing over the years has affected the composition of native vegetation, contributed to the introduction of nonnative plant species, and polluted or otherwise disturbed streams and riparian areas. In areas of the park where grazing was allowed, these effects would continue into the future. Under the proposed action the Park Service would develop and use various techniques involving fire and vegetation management to minimize grazing's adverse effects on exceptional resources such as riparian areas and rare and sensitive plant species. These actions would only mitigate adverse effects; they would not prevent them.

To reduce the recurring conflicts between visitors and livestock, methods would be used to separate cattle and sheep from park visitors and from sensitive resources. Methods would include fencing campgrounds in the modern subzone, placing tighter controls on stock movements, and encouraging cattle to use suitable areas away from visitor gathering areas by salting, constructing water troughs, and other range management techniques.

To protect sensitive plants as well as the Bonneville cutthroat trout, grazing would be prohibited in all areas zoned as protected natural areas and research natural areas. These are primarily areas with limited forage above 10,500 feet in elevation, but they also include the watersheds of Pine and Ridge creeks on the west side of the park. Endangered and sensitive plant species outside protected natural areas would be protected from the effects of grazing by tightening control of livestock movements, limiting permitted grazing areas, and possibly fencing off some critical resource areas.

The Park Service is preparing a rangeland analysis and seven allotment management plans for the park, to be completed in 1991. The plans would prescribe methods for managing each of the grazing allotments in the park. To protect riparian zones, wet meadows, and other sensitive and important resource areas from the effects of grazing, the Park Service might use vegetation management methods to increase natural forage in areas with less sensitive resources. If forage production increased in the future, thus increasing the carrying capacity of the range within the park, no additional livestock beyond the current numbers would be allowed on the grazing allotments in the park.

Any grazing allotments in the park that were vacated for any reason by the recognized permittee of record would be reallocated consistent with sound range management principles or would be permanently withdrawn from domestic livestock grazing if in the best interest of resource protection and visitor use.

Mining and Mineral Exploration. The Park Service regulates mining claims under 36 CFR 9A by requiring every operator to prepare a plan of operations before commencing any mining or nonmining operations on any claim. A plan of operations provides the Park Service with specific information about the proposed mining activity and the exact locations that will be mined. The information requirements in a plan of operations include a map of the area proposed to be mined, a description of the mode of transport and equipment to be used, a timeframe for each phase of the operation, a description of the reclamation plan, an environmental report, and other descriptive elements. After a plan is prepared, the Park Service approves, recommends modifications to, or rejects the plan based on the anticipated impacts of the mining.

There are currently 247 mining claims within the park. Most of these claims are in the immediate vicinity of Mt. Wash-

ington and many are in the heart of the ancient bristlecone pine forest. Because this forest is one of the most important biological and scenic resources in the park and a contributing reason for its establishment, the proposed action emphasizes the need to limit and severely restrict the impacts of mining in this area. The Park Service would continue to recognize all valid existing mining claims and to monitor and enforce the regulations governing mining within park boundaries. However, it would not approve any plans of operations for mining within the park if the proposed mineral exploration or mining activities would threaten any scenic or major biological resources on a permanent basis.

The Park Service would continue to examine the validity of all existing mining claims within park boundaries. If a claim was found to be invalid, the Service would recommend to the Bureau of Land Management that the claim be extinguished.

In keeping with the *NPS Management Policies* (chapter 9.4), when park managers sought sources of sand, gravel, and borrow material for administrative use, they would first look outside the park for these sources.

Abandoned Mineral Lands. Past mining and mineral exploration have had adverse effects on the soils, vegetation, topography, and visual quality of the park's backcountry. Abandoned waste rock, mine shafts, exploration pits, and gravel pits exist in many areas. Most of this disturbance is in the most remote portions of the park, and much of it is in areas of great ecological sensitivity (e.g., Johnson Lake, Mt. Washington). Mine tailings and excavated pits are very slow to revegetate, and tailings often leach heavy metals and other contaminants into streams and lakes. Abandoned mines often contain substantial amounts of rusted equipment, cable, and man-made debris, causing visual blight and potential safety hazards. Past mining has also had indirect effects on the park. To reach the mines, four-wheel-drive roads and routes were bulldozed into the landscape. Many of these routes were poorly constructed on excessive grades and now exist as eroded gullies and long-term scars.

Under the proposed action abandoned mining equipment and materials that are not historically significant would be removed. Abandoned adits, shafts, pits, etc., would be backfilled and reclaimed where feasible; any adits and shafts that could not be filled would be netted, grated, or otherwise made safe for visitors. Any identified impacts on water quality would be mitigated. Access routes and mining sites

would be rehabilitated and revegetated by the park staff as funds were made available. All plans of operations for future mining activity would include requirements to reclaim the sites.

The Park Service would continue to cooperate with the Nevada Department of Wildlife in managing fish and wildlife. The park's management direction for specific species would be as follows.

Fish and
Wildlife

Bonneville Cutthroat Trout. The Park Service, in cooperation with the Nevada Department of Wildlife, would reestablish Bonneville cutthroat trout into selected streams on the east side of the park. East-side streams would be selected on the basis of habitat suitability and the relative difficulty of removing existing nonnative fish species. Any competing nonnative fish species present in the streams selected for reintroduction would have to be eliminated to assure survival of the reintroduced trout and to protect the genetic integrity of the population. Special fishing regulations might be necessary to protect Bonneville cutthroat during and after their reestablishment. These regulations would be developed in cooperation with the Nevada Department of Wildlife. In addition, the impacts of grazing activities in the watershed would be carefully monitored to ensure that the fish would not be jeopardized.

The populations of Bonneville cutthroat trout in Pine and Ridge creeks on the west side of the park would be protected from man-caused influences. These drainages would be zoned as protected natural areas, and domestic livestock grazing would be prohibited in the drainages containing cutthroat populations to minimize adverse effects on the aquatic and riparian habitats of the streams. In addition, the Park Service would actively work with the Nevada Department of Wildlife to establish regulations that would ensure protection for the Bonneville cutthroat trout in these streams and others in which they were reintroduced.

Stocking of Nonnative Fish Species. The Park Service would not permit stocking of nonnative fish species in the waters of the park. However, existing fish species remaining from past stocking activities would not be eliminated, except in streams selected for the reintroduction of Bonneville cutthroat trout.

Rocky Mountain Bighorn Sheep. The Park Service does not expect the Rocky Mountain bighorn sheep herd within the park to survive at current nonviable population levels. Also, research has shown that bighorn sheep reintroductions

are rarely successful where bighorns are placed on ranges that they must share with domestic livestock. If the herd died off, the Park Service would not attempt to reestablish Rocky Mountain bighorn sheep until the problem of the incompatibility of this species with domestic livestock could be solved.

Elk. Unless research provided additional data indicating that elk are not native to the South Snake Range, elk would be protected and allowed to establish a viable herd.

Mule Deer. Mule deer populations in the park would be allowed to fluctuate naturally in response to environmental factors such as natural predation and varying range conditions. If populations increased to the extent that ranchers outside the park experienced serious crop loss, the Park Service would cooperate with the Nevada Department of Wildlife, as it has in the past, to establish hunting seasons on lands adjacent to the park to control deer numbers.

Native Predators. Native predators such as coyotes, bobcats, and mountain lions are important to the ecological balance of the park. All native predators would be strictly protected within the park boundaries. Because many predators routinely range beyond the park boundary, the Park Service would work with surrounding land management agencies to protect predators and ensure that predator populations are maintained at natural levels.

Threatened,
Endangered,
and Sensitive
Species

Park management would be proactive in reestablishing and protecting habitat for all threatened and endangered species. Management would continue to cooperate with the Forest Service, the Nevada Department of Wildlife, the Peregrine Fund, and other agencies to reestablish the peregrine falcon. Existing Bonneville cutthroat trout populations and their habitat would be strictly protected, and additional populations would be reestablished in the most suitable streams on the east side of the park. Riparian areas along these streams, which are critical to the species' survival, would receive increased protection because various management techniques would be used in these areas to reduce or mitigate the effects of livestock grazing. In all alpine areas (designated as protected natural area subzones) domestic livestock grazing would be prohibited to protect the rare plant species and rare endemic plants that grow there. Persons managing livestock herds would be required to recognize and avoid these areas as a stipulation of their grazing privileges.

The park would continue to identify all state listed threatened, endangered, rare, declining, sensitive, or candidate species native to and present in the park along with their critical habitats. These species would be given special consideration in all future planning activities and in the management of special uses and activities such as grazing and mining.

A number of introduced plant species exist within the park. Examples include knapweed, dandelion, clover, cheatgrass, and numerous other grasses. These species would be eradicated or controlled if they threatened to spread or compete with park resources and if control was feasible. Care would be taken that programs to manage nonnative species did not result in significant damage to native species.

Nonnative
Plant
Species

Through interagency agreements, the Park Service would continue to provide support to the Forest Service, Bureau of Land Management, and Nevada Division of Forestry by responding in the initial attack on all wildland fires on public lands close to the park and participating in all firefighting activities on public lands in the region. In addition, other agencies might provide resources as needed to control wildfires within the park. The park would continue to maintain wildland firefighting equipment and a fire cache for personnel within the park near the Lehman Cave interpretive center.

Wildland
Fires

The Park Service would develop a wildland fire management plan for the park. This plan would probably include provisions for prescribed natural fire and prescribed burning.

A cave management plan would be prepared to provide recommendations for preservation and management of all caves and cave resources in the park. As a first step, all caves would be located and inventoried to determine their biotic and abiotic components, significance, and sensitivity to human influences. Based on the findings of the inventory, the plan would prescribe actions for the management of caves to ensure visitor safety and provide protection against vandalism and for the long-term monitoring of cave resources.

Cave
Management

Issues concerning the use and management of Lehman Cave would be addressed in a separate visitor impact study, which would be incorporated into the final cave management plan. The visitor impact study would determine acceptable use levels and the most appropriate means of perpetuating this nationally significant cave (see the "Other Studies and Plans" section for details).

Water Resources and Water Rights	Baseline water quality data would be gathered from all streams and lakes in the park. Measurements would include both biotic and abiotic elements relating to water quality. The baseline data would be used to monitor streams for possible future disturbances and to locate and mitigate present and future impacts in park watersheds. To the degree feasible, the actions proposed in the plan would be accomplished using water rights currently held by the United States. If additional water was needed, rights would be obtained in accordance with state law. All rights to water diverted to or used on park lands for grazing or other permitted activities would be perfected in the name of the United States.	CULTURAL RESOURCE MANAGEMENT
Air Quality	Great Basin National Park is a class II clean air area as designated under provisions of the Clean Air Act (42 USC 7401 et seq.). The Clean Air Act established maximum allowable increments beyond baseline concentrations of sulfur dioxide, nitrogen dioxide, and particulate matter that cannot be exceeded. These increments would allow modest industrial growth in the vicinity of the park. Because of the outstanding resources to be preserved in the park and their possible susceptibility to air pollution impacts, park managers would work with the state of Nevada to seek redesignation of Great Basin as a class I area. With class I designation, the park and its air quality related values – visibility, plants, animals, water quality, and cultural and other resources – would be given additional protection from air pollution impacts. Section 118 of the Clean Air Act requires all federal facilities to comply with existing federal, regional, state, and local air pollution control laws and regulations. Great Basin managers would work with the Nevada Division of Environmental Protection to ensure that all in-park activities met the requirements of the <i>Nevada Air Pollution Control Implementation Plan</i>. Air pollution, even at concentration levels below national ambient standards, can harm vegetation, degrade visual quality, and diminish visitors' enjoyment. Great Basin National Park was established to preserve outstanding resources and significant geological and scenic values. The vitality, significance, and integrity of those resources depend on good air quality. Park managers would actively cooperate in all regional efforts to maintain pristine air quality and remedy any existing air pollution effects.	
	Three historic sites in the park's modern zone were listed on the National Register of Historic Places in 1975 as locally significant resources – the Lehman orchard, Lehman aqueduct, and Rhodes cabin. Under the proposed action one additional site – the Osceola (east) ditch – would be nominated to the National Register. Several other properties appear to meet the National Register criteria, and determinations/nominations would be needed for these. The Lehman orchard, planted in the mid-1880s by Absalom S. Lehman, the discoverer and early developer of Lehman Cave, represents early agricultural and horticultural development in the Snake Valley to meet the need for food in the area's scattered mining camps. The orchard once covered more than 7 acres, but in recent times it had been reduced to a few remnant fruit trees. Under the direction of the park's 1990 <i>Orchard Management Plan</i>, the orchard has now been expanded to 40 trees. An exhibit panel interpreting the orchard is proposed in the immediate vicinity of the Lehman Cave interpretive center. The Lehman aqueduct, a 2-mile irrigation ditch and wooden flume constructed by Lehman during the 1880s, is representative of early agricultural irrigation efforts in Snake Valley. Lehman built the ditch and flume to transport water from Lehman Creek and several other nearby water sources to his orchard and homestead below the mouth of the cavern. Portions of the flume have been reconstructed, and sections of the ditch have been restored or given other preservation/stabilization treatment near the present Lehman nature trail. Under the proposed action the remains of the flume and ditch would be preserved, and additional interpretation would be provided at the Lehman Cave interpretive center. The Rhodes cabin, which has been moved from its original location, restored, and placed on a concrete foundation, is currently being used to house interpretive exhibits. Constructed in the 1920s to provide accommodations for visitors to Lehman Caves National Monument, the log cabin is on the northeast side of the present Lehman Cave visitor center. Under the proposed action the cabin would continue to be given preservation treatment and used adaptively to house interpretive exhibits concerning Rhodes and the cabin's original purpose. The Osceola (east) ditch is recommended for nomination to the National Register because of its significance as an engineering work and its association with hydraulic placer mining operations in the Snake Range. Constructed in	

1889-90, the ditch extended some 18 miles on its north-northwesterly course, conveying water from Burnt Mill Canyon, Hill, Strawberry, Lehman, Sage, and Weaver creeks on the east side of the range to Osceola on the west slope. Sections of the ditch were wooden flumes. The Stella Lake rock dam was built as a component of the ditch to increase the lake's storage capacity and the summer flow of Lehman Creek. Some 10 miles of the ditch, including remnants of wooden flumes and a 600-foot tunnel, are within the park boundary. Under the proposed action an interpretive trail would be developed from Wheeler Peak Scenic Drive to the ditch to illustrate the ditch's historical significance and general operation. At the end of the trail a small portion of the deteriorated wooden flume and ditch excavation would be rehabilitated and rewatered. This feature would be managed and interpreted as an outstanding cultural feature.

A 600-foot-long tunnel - one of the Osceola ditch's most significant engineering features - is near the northern boundary of the park in Strawberry Creek Canyon. The tunnel, which would be in the semi-primitive subzone, would be given preservation/stabilization treatment (Spring Valley side opening only), and an interpretive loop trail would be constructed in Strawberry Creek Canyon to include the tunnel site, with a trailhead orientation exhibit at the west end of Strawberry Creek and a self-guiding publication focusing on the construction history and engineering significance of the ditch. Except for these two interpretive areas, the ditch would be left as is, with no action taken to preserve or remove it. The resource's surface and subsurface remains would deteriorate naturally and eventually be reclaimed by natural processes.

The Johnson mill and mine sites are representative of early 20th century mining ventures in the area of the park. The Johnson mill, along the Johnson Lake trail about 1 1/2 mile below the lake, consists of a partially collapsed, two-story log ore-processing mill and log structure, both of which probably date from between 1910 and the early 1930s when the Johnson tungsten mine above the lake was developed. The Johnson mine, at Johnson Lake, consists of four partially collapsed log structures southeast of the lake, an in-place cableway and collapsed cableway terminal structure above the lake, an unstable adit and a partially collapsed slope in the mountainside, a rock dam at the southeast end of the lake, various test pits, and considerable refuse scatter and mining machinery remnants. The Nevada state historic preservation officer feels that this property may be eligible for the National Register. Under the proposed action a nomination form would be prepared, and a formal

determination obtained. The nonhistoric refuse scatter would be removed, but the historic mining debris and machinery remnants would be left in place. This would be accomplished under the supervision of a historical archeologist.

Although many of the historic sites in the park are not of National Register caliber, they have some historical and interpretive value. Among the more accessible resources that might be encountered by day hikers is the Wheeler Peak triangulation station site atop the mountain summit. The site includes remnants of rock foundations from the original U.S. Coast and Geodetic Survey structures, which were built during the late 1870s and 1880s to conduct observations during the agency's 2,500-mile geodetic arc of triangulation between the Atlantic and Pacific coasts along the 39th parallel of latitude. This site would also be left to deteriorate naturally and would be interpreted at the park visitor center and in a park pamphlet of the area.

Throughout much of the park's backcountry there are scattered sites and remains of small mining ventures, isolated cabins or cabin groups that are collapsing or deteriorating, and extant remnants of historic relics such as wagons. These sites have been evaluated for historical significance (NPS, Unrau 1990c) and found not to meet the National Register criteria for nomination. A high priority is to complete archeological surveys and evaluations and to seek a determination of the sites' eligibility based on the National Register criteria for archeological significance. Sites eligible for the register would require consultation with the state historic preservation officer under section 106 of the National Historic Preservation Act of 1966 before any undertaking that might affect them.

Possible actions at sites posing danger to visitors could include closing and sealing mine shafts, adits, tunnels, stopes, and test pits; removing hazardous structures and nonhistoric debris; returning sites to natural conditions; and removing artifacts. Safety priorities would be based on the degree of hazard and visitor accessibility.

Less than 2 percent of the park has been systematically surveyed for archeological resources. To date, most of the surveys have been conducted in the vicinity of the Baker Creek cave system, Lehman Cave, the park entrance and Lehman Flats, Baker Ridge, and the Baker guard station (the proposed orientation center/administration site).

The known prehistoric sites, which span the Paleo-Indian, Great Basin Desert Archaic, Parowan Fremont, and Western

Shoshone periods, include 16 artifact scatters, one lithic scatter, nine rock art sites, and four caves. In addition, more than 40 prehistoric isolated finds have been identified. Funding would be sought for further archeological studies, and a comprehensive parkwide inventory of archeological resources would be completed to evaluate their contextual significance and interpretive value. Until this data base was developed, cultural resources that have already been evaluated under National Register criteria A, B, and C would also be evaluated for their significance and possible nomination to the National Register under criterion D. This evaluation would be carried out in consultation with the Nevada state historic preservation officer. In addition, areas to be affected by ground disturbance and development would be surveyed, and archeological clearance obtained, before initiation of such projects. This would include archeological testing to determine the nature and extent of the archeological resources to be affected. After testing, every effort would be made to avoid adverse impacts on resources. If adverse impacts could not be avoided, a plan for mitigation of those impacts would be developed in consultation with the state historic preservation officer. Mitigation would normally involve data collection through controlled surface collection of artifacts, excavation of buried remains, mapping of features, and production of a report. An ethnographic overview and parkwide ethnographic survey would also be produced.

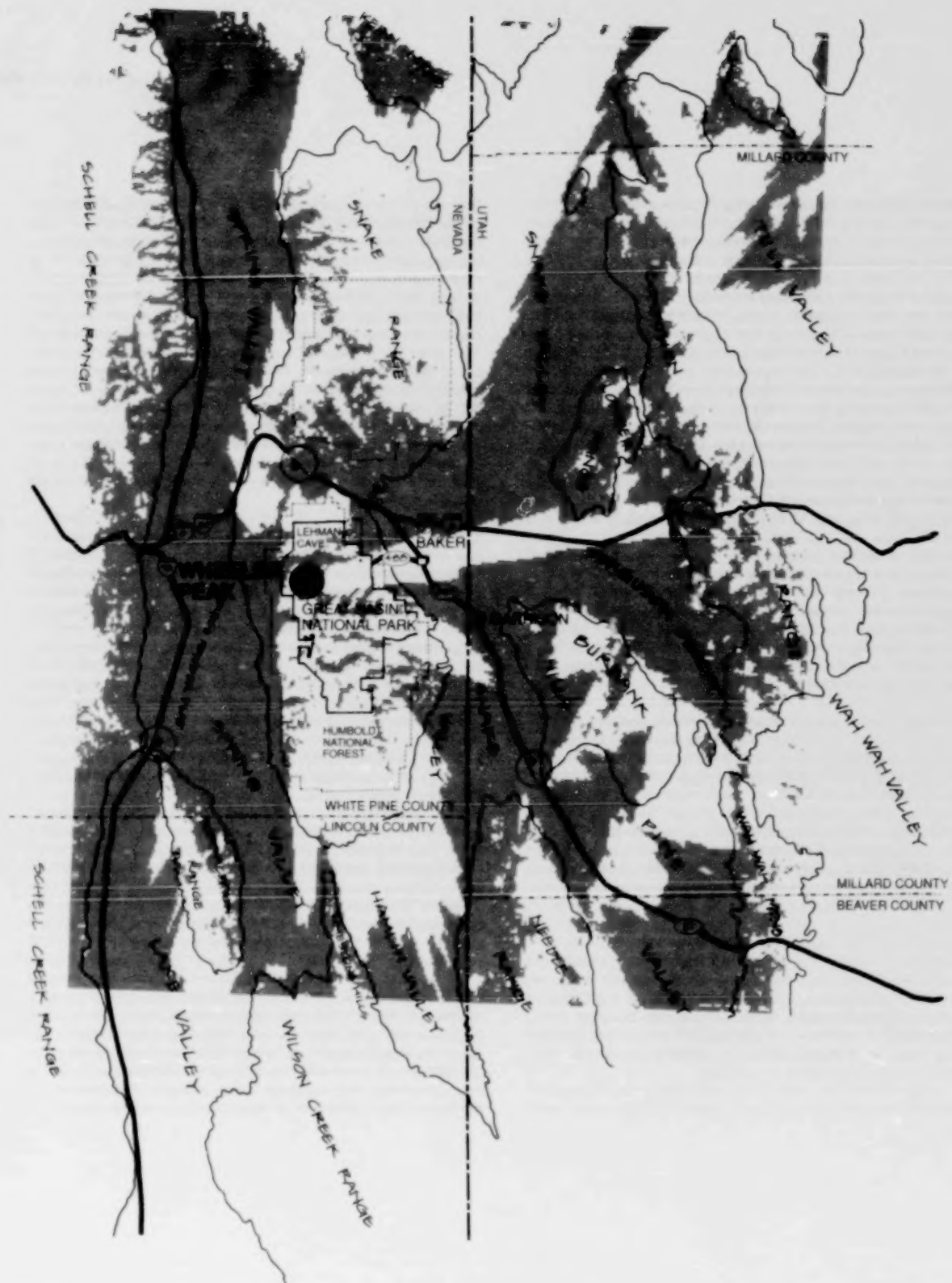
The present park museum collection consists primarily of objects relating to the history of Lehman Cave and Absalom Lehman. It is proposed to expand this collection to include items that contribute to the understanding and interpretation of the principal themes of Great Basin National Park. A scope of collection statement has already been prepared; a collection management plan would also be completed to guide the expansion of the collection. The state historic preservation officer would be asked to comment because Great Basin is a new park with a small existing collection that would likely increase substantially.

Public Law 99-565 established Great Basin National Park to provide protection for a portion of the South Snake Range. Although the lands within the park boundary provide exceptional representation of the range portion of the Great Basin physiographic region, no basin lands are included. Further, none of the basin environments - including adjacent Spring Valley and Snake Valley - received any protection or special consideration under PL 99-565.

The views of and across the Spring Valley and Snake Valley basins are extremely important to the Great Basin visitor experience. From a number of park viewing areas people can see nearly 100 miles, with commanding vistas of the valley basins and the mountains ranges beyond. Both daytime and nighttime views are spectacular from the park and from strategic entry points into the South Snake Range. These views are also critical in fulfilling the park's purpose "to preserve and interpret a representative segment of the Great Basin physiographic region possessing outstanding resources and significant geological and scenic values" (PL 99-565). The Snake Valley and Spring Valley basins constitute "the other half" of this region, representing an invaluable scenic resource. If Great Basin National Park is to be more than just a name, the integrity of the views associated with these two basin landscapes must be preserved in perpetuity.

A computer-generated graphic analysis was completed as part of this planning effort to identify lands outside the park that would be visible from the critical viewing areas identified to date. This included lands in the Snake Valley visible from the park's primary visitor use areas on the east side of the South Snake Range (the Great Basin visitor center on Baker Ridge, the Lehman Cave interpretive center, the mahogany shrub/Mt. Moriah overlook, and the aspen/Lehman Creek pullout); lands in both the Snake and Spring valleys visible from the four proposed regional exhibit shelters along the main approaches to the park (southeast, east, north, and southwest) and from the composite viewsheds of two, three, and four shelters; and lands visible from Wheeler Peak, including all exceptional resources associated with the Snake and Spring valley basins. The results of the computer analysis were displayed on 14 viewshed graphics, which are on file at the park. The graphics showing the critical viewing areas from Wheeler Peak and from the composite of all exhibit shelters are included in this section. All lands visible from one or more of the above viewing areas are considered critical to the visitor experience. Because approximately 90 percent of these lands are in federal ownership, it should be possible to provide the necessary protection for the viewsheds.

The Park Service would review, evaluate, and make recommendations to local governments concerning all proposals for major developments or activities that might affect the visual integrity of Spring Valley or Snake Valley. It would maintain a set of 1:250,000 scale USGS maps and associated viewshed maps for use in evaluating potential developments or activities on lands visible from previously



WHEELER PEAK CRITICAL VIEWING AREA GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

148 • 20050 • DSC • SEPT 91

Land Protection and Boundary Adjustments



0 5 10 MILES
0 5 10 15 KILOMETERS

described locations, and it would also conduct on-site evaluations as appropriate. Evaluations would start as soon as the development or activity was proposed, and recommendations would be made at each stage of the proposal review process. Grazing, small agricultural developments, and daily ranching activities would not be subject to viewshed evaluation.

The four proposed regional exhibit shelters would be developed and maintained by the Park Service through a cooperative agreement with the Bureau of Land Management and appropriate state agencies. The park's establishing legislation allows the Park Service to work with other agencies and interests in developing interpretive facilities and programs on lands that are not administered by the Park Service.

Regional
Exhibit
Shelter
Sites

Two sections of Forest Service land (1,280 acres) along the eastern park boundary and adjacent to the proposed Great Basin visitor center would be transferred from the Forest Service to the Park Service. These lands would provide a visual buffer for the proposed visitor center and associated Great Basin observation deck and would also simplify management by incorporating two isolated sections into the national park.

Baker Ridge
Addition

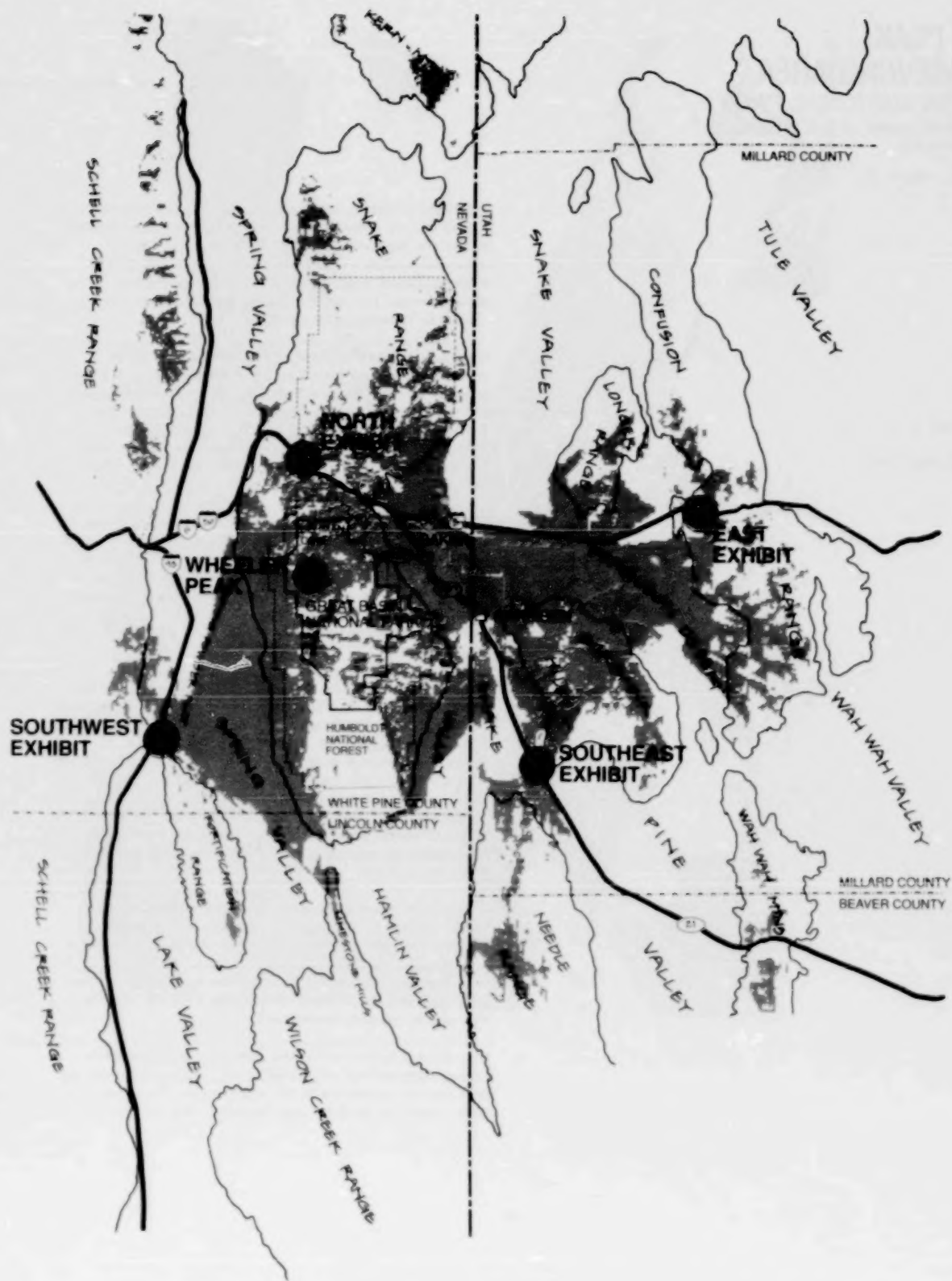
Rights-of-way would be obtained from the Bureau of Land Management and the Forest Service for access to the park along the new park entrance road and the Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch approach roads. The entrance road right-of-way would extend 400 feet on each side of the road centerline; other rights-of-way would extend 200 feet on each side. The exact mileages of the rights-of-way are shown in table 13 in the impacts of the proposed action section. The Park Service would be responsible for upgrading and maintaining the roads within these rights-of-way.

Rights-of-Way,
Cooperative
Agreements,
and
Easements

Cooperative agreements would be established with the Forest Service for the development and use of parking area/trailheads at the ends of the Big Wash and Lexington Arch approach roads. An easement would be sought for the portion of the Big Wash trail extending across private land (approximately 3,000 linear feet of trail from the proposed trailhead to the park boundary).

No patented lands exist in the park, but nine patented claims, representing about 200 acres, delineate the western park boundary adjacent to Mt. Washington. These patented lands create an irregular park boundary that many refer to

Patented
Mining Claims
adjacent to the
Park Boundary



COMPOSITE CRITICAL VIEWING AREAS FROM EXHIBIT PULLOUTS

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

148 • 20051 • DSC • SEPT 91

Other Studies and Plans

- AREAS SEEN FROM 1 PULLOUT
- AREAS SEEN FROM 2 PULLOUTS
- AREAS SEEN FROM 3/4 PULLOUTS



0 5 10 MILES
0 5 10 15 KILOMETERS

as the "keyhole," and some of the claims are in prime Mt. Washington bristlecone habitat. Any surface disturbance or facility development associated with mining or commercial activity on patented lands would not only threaten the bristlecones on the claim, but could pose an indirect threat to the biological integrity of the park's bristlecone forest across the boundary. Such activity could also create visual intrusions or landscape scars visible from the park. A major reason for the establishment of Great Basin National Park was to provide protection for the unique bristlecone forest habitat. Because the Park Service has no authority to prohibit or control commercial development on patented claims outside the park when access is not across park land, the general management plan proposes that a long-range Park Service goal should be to submit a recommendation to Congress for a boundary addition in this area and to acquire these claims to ensure preservation of the nationally significant bristlecone resource. Until that time, the Park Service would work with property owners and local, county, state, and other federal officials to ensure protection of resource values.

The 247 unpatented mining claims within the park boundary would continue to be examined for validity. If a claim was found invalid, the Park Service would recommend to the Bureau of Land Management that the claim be extinguished. For any claims found to be valid, the Park Service would ensure compliance with the Mining in the Parks Act (16 USC 1901 et seq.) by requiring plans of operations for all mineral activities associated with those claims.

Unpatented
Mining
Claims
within the
Park
Boundary

In the long term the general management plan proposes to acquire all valid unpatented mining claims through donations or bargain sales, exchanges, or acquisition from willing sellers. The enabling legislation for the park prevents the Park Service from condemning land or interests in land within the boundary. If it became necessary to purchase a claim without the owner's consent in order to prevent mining operations from adversely affecting important park resources, the Park Service would seek congressional support to amend the enabling legislation to allow condemnation of specific claims and would seek appropriated funds for purchase.

A hydrologic examination of the Baker, Lehman, Strawberry, and Snake creek watersheds would be conducted to evaluate the flood hazard potential of those streams. At present, campgrounds in drainages acquired from the Forest Service are along streams, with some sites next to flowing water. The study would evaluate the hazards to visitors in

OTHER
STUDIES
AND PLANS
Flood Studies

PROPOSED ACTION

campgrounds and other visitor use areas and would recommend actions to eliminate those hazards.

Lehman Cave Visitor Impact Study

A study would be planned and developed to evaluate the impacts of human presence on the formations and biota within Lehman Cave. At present, little is known about the ability of the cave to withstand human use without significant adverse effects to the geologic formations and the biological elements dependent on the natural cave environment. The study would, at a minimum, evaluate temperature, humidity, light, noise, the gaseous components of the air, and the introduction of foreign nutrients as they relate to human presence in the cave and the resources in the cave environment. The Park Service would use the research to establish acceptable use levels for the cave and to develop mitigating measures to minimize the effects of visitor use on the cave and cave components. Until the study was completed, the maximum daily capacity of the cave would be maintained at 600 people per day. The results of the visitor impact study would be included in the proposed cave management plan.

Collection Management Plan and Cultural Studies

The park has a small collection of museum specimens, artifacts, and archival/documentary materials representing the natural and cultural history of the area, and this collection is likely to be augmented by future survey and research efforts. To ensure proper documentation, preservation, and interpretation of the collection, a collection management plan would be prepared in accordance with the standards and guidelines in NPS-28, *Cultural Resources Management Guideline*, and the *NPS Museum Handbook*. The plan would include a scope of collection statement, a description of the collection, and an evaluation with recommendations for storage, preservation, maintenance, and exhibit.

Among the cultural studies needed, according to NPS-28, are archeological identification studies, archeological evaluation and documentation studies, an ethnographic overview and assessment, and ethnographic oral histories and life histories.

Interagency Great Basin Regional Interpretive Plan

The establishing legislation for Great Basin National Park called for cooperative interpretation of the Great Basin physiographic region by federal, state, and local agencies with a presence in the area. After the general management plan was approved, an interagency interpretive plan would be prepared by agency representatives from the five states that comprise the Great Basin physiographic region. The plan would establish and apply site selection criteria and would recommend actions for on-site interpretation of a

larger and more complete spectrum of representative sites throughout the region. Two NPS new area studies (1980, 1981) have identified sites with potential for representing the Great Basin theme. The information provided in these studies would serve as a starting point for developing a list of study sites for the interagency interpretive planning effort. Because these sites would be administered by different agencies and interests, the focus of the interagency effort would be to ensure uniform and coordinated interpretation. Interpretive and visitor use concepts defined in the interpretive plan would be implemented by the agencies or interests administering the selected sites. This coordinated effort would prevent a piecemeal approach to interpretation. Interpretive media (logos, signs, exhibits, audiovisuals, and publications) would be designed to create a "family resemblance" – a continuity of design that could be easily identified by visitors, reinforcing the fact that these sites represent the same system.

A sign plan would be prepared by the Park Service's Western Regional Office with assistance from park staff to establish a common format and appearance for all park signs. Park signs should be compatible with the natural features of the park, yet easily visible from roads or at trailheads. Sign messages should be clear, concise, and quickly understood. Regardless of the message conveyed, each sign should be recognizable as a Great Basin National Park sign. The sign plan should be prepared before the wayside exhibit plan (see below) so that exhibit planners can follow park sign standards.

Parkwide Sign Plan

A wayside exhibit plan would be prepared by the Harpers Ferry Center to identify the messages and the materials for the proposed wayside exhibits. The exhibit hardware would be compatible with the parkwide sign format.

Wayside Exhibit Plan

ALTERNATIVE A – NO ACTION/MINIMUM REQUIREMENTS

Under alternative A there would be no significant changes in present management and visitor use. Actions necessary to meet legislative requirements, protect natural and cultural resources, and address health and safety concerns would be taken, but no new areas of the park would be opened to visitor use and few additional interpretive or recreational facilities would be provided. The primary visitor attractions would continue to be Lehman Cave and the sights, features, and facilities along the existing Wheeler Peak road. Existing weekend camping areas in Strawberry, Baker, and Snake creeks would be maintained. Visitor opportunities in the central and southern parts of the park would be limited. There would be no modifications to the road system.

ZONING RATIONALE

Management zoning under this alternative would reflect minimum changes to existing conditions. The entire Lehman Cave/Wheeler Peak road area would be included in the modern subzone, and the Wheeler Peak day use area would be designated for semi-primitive day use. Existing weekend camping areas would become part of the rural subzone, and existing hiking and horseback riding areas would be placed in the semi-primitive subzone. The remainder of the park would be zoned primitive and open only to visitors willing to take the time and effort to make their way into the backcountry. No areas would be zoned as protected natural and research natural areas. The zoning concept is illustrated on the Alternative A – No Action/Minimum Requirements map.

The acreages of the zones and subzones would be as follows:

- park development zone – 939 acres
- modern subzone – 939 acres
- natural zone – 76,133 acres
- rural subzone – 4,178 acres
- semi-primitive day use subzone – 1,574 acres
- semi-primitive subzone – 12,356 acres
- primitive subzone – 58,025 acres
- special use zone – 10 acres

VISITOR USE AND DEVELOPMENT

This alternative would not promote visitor understanding or exploration of the new national park and surrounding Great Basin physiographic region. Existing uses would be supported, and orientation, information, and interpretation would be provided, but only a few areas of the park would

be available for other than backcountry use, and opportunities to learn about its many natural and cultural features would be limited. The following actions would be taken in the park's designated zones and subzones, as illustrated on the Alternative A – No Action/Minimum Requirements map.

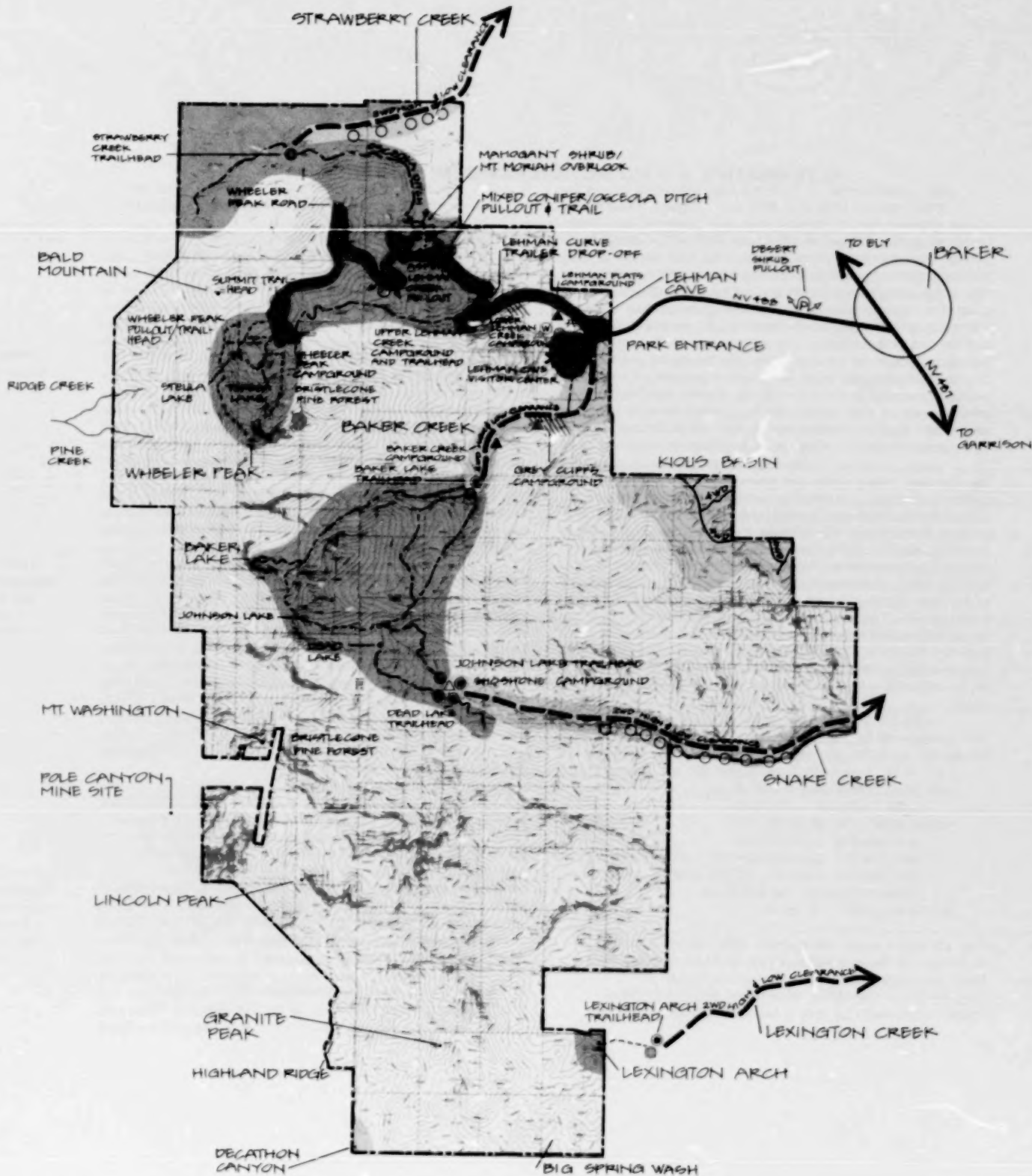
All major, permanent interpretive and recreational facilities would be included in this subzone. The Lehman Cave visitor center would remain the primary focus of interpretation and the place virtually all first-time visitors would go to obtain information about the park and region. Existing roadside pullouts and trailheads would include interpretive exhibits or panels, and existing interpretive trails, campgrounds, and picnic areas would be maintained. No new visitor center, orientation center, or highway interpretive exhibit shelters would be provided. Visitors would have frequent encounters with one another in this subzone, and opportunities for solitude would be rare.

Modern
Subzone

Park Entrance. The existing 5-mile-long park entrance road outside the park boundary (Nevada Highway 488) would continue to provide access to the park. The Park Service would establish a cooperative agreement with the Bureau of Land Management for use and protection of lands along this road and would seek to acquire easements from private landowners to reduce the possibility of incompatible development on lands adjacent to the road. A desert-shrub wayside pullout would be established on the north side of the road and would include parking for 5 to 8 cars. An entrance sign would be placed at the park boundary, but no parking would be provided near the sign.

Lehman Cave. Inside the boundary, visitors would follow the existing Lehman Cave spur road a short distance to the upper and lower parking lots in front of the Lehman Cave visitor center. The upper lot would be restriped to provide parking spaces for disabled visitors. A 50-car overflow parking area would be constructed on the site of the existing picnic area, and the picnic area would be relocated near that parking area. A new wheelchair-accessible trail (as described in the proposed action) would lead from the overflow parking area to the visitor center.

The visitor center would be retained as the main visitor facility. Administrative offices would be moved out of the



ALTERNATIVE A/MINIMUM REQUIREMENTS (NO ACTION) GREAT BASIN NATIONAL PARK

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Visitor Use and Development

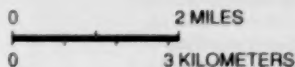


center to a new administration building adjacent to the proposed overflow parking area (see the "Administrative Facilities" section). The interior of the visitor center would be remodeled, although its size and exterior appearance would remain the same. The front door of the building would be made accessible for disabled visitors. Visitor center functions would include park and region orientation, information, and trip planning, interpretation of all major park themes, Lehman Cave ticket sales and tour operation, natural history association sales, and the existing concession operation. Two offices would be provided for interpretive staff. The Park Service would continue to irrigate the lawn areas around the building to provide pleasant places for visitors to relax while waiting to take cave tours.

The Lehman nature trail behind the visitor center would be maintained as an interpretive loop trail. Interpretation of the geology and history of Lehman Cave would be provided through a self-guiding publication. The Rhodes cabin would be adaptively used to house new interpretive exhibits describing its original function as overnight lodging for early Lehman Cave visitors. An interpretive panel would be installed outside the cabin to explain its history. Approximately 40 trees of the Lehman orchard would be reestablished.

Wheeler Peak Road and Pullout/Trailhead. As in the proposed action, the Park Service would upgrade the 12-mile Wheeler Peak road and several existing pullouts to meet safety requirements and improve interpretation. Vehicle size restrictions would be imposed for travel on the road (only vehicles less than 30 feet in length and 8 feet in width), and a 20-site trailer drop-off would be constructed at Lehman Curve to permit visitors pulling trailers to park them and travel on up the Wheeler Peak road. Visitors in oversized RVs would not be permitted past this point.

The mixed conifer/Osceola ditch pullout would include parking for 5 to 10 cars and a short high-standard interpretive trail through the forest; the historic ditch and flume would not be restored, but would be interpreted in exhibit panels. At the mahogany shrub/Mt. Moriah overlook pullout, 5- to 10-car parking and a short barrier-free trail would be developed, but no viewing platform would be incorporated. Selected vistas would be cleared to provide views of Mt. Moriah and the North Snake Range; interpretation would be through exhibit panels. The aspen/Lehman Creek pullout would be upgraded to include paved parking for 5 to 10 cars, a low retaining wall, and viewing areas with interpretive exhibits.



The campgrounds along the Wheeler Peak road would receive the same treatments as described in the proposed action. A new 50-site limited-service campground would be established south of the road above the floodplain in Lehman Flats; potable water and a dump station would be included. The Lower Lehman Creek campground would be removed, and its riparian setting would be restored. The Upper Lehman Creek campground would be maintained, and a trailhead and orientation exhibit would be established there to provide access to the Lehman Creek trail.

The summit trailhead parking area would be formalized, with a traffic island separating it from the roadway. The Wheeler Peak pullout/trailhead would be redesigned as described in the proposed action; parking for 25 cars would be included. The 37-site Wheeler Peak campground would be retained. Two sites would be redesigned for use by disabled visitors, and barrier-free vault toilets would be provided. Potable water would be available.

Administrative Facilities. Administrative functions would be moved to a new building in the park. The size and interior layout for the proposed facility would be similar to that of the Baker facility described in the proposed action (3,000 square feet; office space, two conference rooms, a lobby, a library, curatorial and records space, and restrooms). The new administration building would be built next to the proposed Lehman Cave overflow parking area. A paved access road would lead from the visitor center access road to the administration building. Parking for the facility would be screened from visitor parking by pinyon-juniper vegetation.

The existing maintenance area would be retained. Any required maintenance or materials storage expansion would be accommodated in an enclosed 5-acre area at the existing gravel pit. Access to the gravel pit would be from the Wheeler Peak road.

Existing park housing would also be retained. Three to six additional park housing units and 20 to 25 apartments would be built along an old road alignment on the south side of the existing housing area. Four existing trailers would be removed and replaced with permanent structures. New housing would resemble existing housing in terms of color and use of materials, but design would optimize solar efficiency and emphasize water conservation. Lawn areas around the new residential units would be kept to a minimum, and landscaping would be limited to indigenous plant materials. Because the existing housing area has no indoor or outdoor common space for recreation, housing

units would be clustered around common lawn areas, which would serve as recreation areas for park staff and their families. The existing sewage ponds east of the housing area would be retained, and expanded if necessary, in their present locations. A gravel road from the Baker Creek road would continue to provide access to the sewage ponds. The water storage area would continue to be accessible by a gravel road from the proposed parking area access road. A second 100,000-gallon water storage tank would be added to the system. This would provide a greater peaking capacity for the water supply to handle future park and visitor demands.

Water, electricity, and sewage lines would be extended below ground to proposed facilities - within the housing expansion area, to the proposed administration building, to the proposed maintenance expansion at the gravel pit, and to the proposed Lehman Flats campground (water and sewer only).

Under alternative A, Strawberry Creek, Baker Creek, Kiou Basin, Snake Creek, the Lexington Arch trailhead, and a small area in Decathlon Canyon would be included in the rural subzone. The Decathlon Canyon lands would be zoned rural to allow traditional public access to adjacent Forest Service lands. The Park Service would establish a cooperative agreement with the Forest Service and Bureau of Land Management to use and maintain roads leading to Strawberry Creek, Snake Creek, and the Lexington Arch trailhead. The Park Service would not maintain roads leading to Kiou Basin or Decathlon Canyon. No formal rights-of-way would be established on any of these road corridors.

Existing campgrounds, campsites, and trailheads in rural subzone areas would be maintained for secluded overnight camping and to provide access to the backcountry. Interpretive media would be limited to low-profile signs, information shelters in campgrounds, and orientation exhibits at trailheads. Visitors would have moderately frequent encounters with one another in this subzone, but the rural setting would offer more opportunities for solitude than in the modern subzone.

Strawberry Creek. Campground development in this area would be limited to the designation of five rustic campsites along the creek with perimeter definition, picnic tables, fire grates, and vault toilets. A trailhead, trailhead orientation exhibit, and parking would be developed at the west end of the Strawberry Creek road, providing access to the northern

Rural
Subzone

portion of the park's backcountry. No group campground, interpretive trail, or corral would be provided.

Baker Creek. Three of the four loops at the existing Grey Cliffs campground would be removed; the upper loop would be converted for group camping, with six paved pull-ins, 12 picnic tables, six fire grates, two vault toilets, and an information shelter. No potable water or electricity would be provided. The limited-service Baker Creek campground and the trailhead providing access to Baker Lake would be maintained; an information shelter would also be installed at this campground. The Baker Creek road would remain a gravel road, with a 10-car gravel lot and orientation exhibit at the Baker Lake trailhead. Corrals would not be provided in the Baker Creek area, and there would be no trailhead at Grey Cliffs.

Kious Basin. Designated roads in the existing system of old jeep roads and tracks in Kious Basin would be available for four-wheel driving in high-clearance vehicles. Based on NPS management policies, off-road four-wheel driving would be prohibited in the park.

Snake Creek. Ten rustic campsites would be designated along Snake Creek, and a new six-site rustic campground would be established in the Shoshone campground area. Information shelters would be installed in both areas. The Johnson and Dead Lake trailheads would be redesigned to include 10-car parking and orientation exhibits. No corral would be provided at the Johnson Lake trailhead.

Lexington Arch. A 10-car parking area, trailhead, and orientation exhibit for the Lexington Arch trail would be constructed about 1 mile from the park boundary. The Park Service would establish a cooperative agreement with the Forest Service and Bureau of Land Management to maintain access to this developed area.

**Semi-Primitive
Day Use
Subzone**

The semi-primitive day use subzone would include the Wheeler Peak day use area only. Hiking trails would provide access to the significant features in the area, including the bristlecone pine forest, subalpine lakes, glacier, rock glacier, alpine tundra, and Wheeler Peak. Interpretive exhibit panels and low-profile directional and safety signs would be provided. Visitors would have moderate to frequent contacts with one another in this subzone, and opportunities for solitude would be rare.

Trail maintenance, rehabilitation, reconstruction, and interpretation would be carried out in the Wheeler Peak area,

as described in the proposed action. Of the 4.5 miles of existing trails, 0.9 mile would be maintained, 1.5 miles would be rehabilitated, and 2.1 miles would be reconstructed or relocated. One new trail would be constructed – the 0.1-mile barrier-free Wheeler Peak meadow loop trail described in the proposed action. This trail would be routed through spruce forest, meadow, and streamside areas, and wayside exhibit panels would provide interpretation of natural resources along the trail route. Orientation exhibits would be established at all trailheads for the Wheeler Peak trail systems. Visitors could take ranger-guided interpretive walks or explore these areas on self-guiding interpretive trails of varying degrees of difficulty.

Under alternative A the semi-primitive subzone would include the Strawberry Creek/Osceola ditch vicinity, the area containing the Lehman Creek trail, the land circumscribed by the Baker Lake/Johnson Lake trail systems, and a small parcel around Lexington Arch. Well-marked trails for hiking and horseback riding would be maintained in these areas, and visitors could also travel overland. Contacts in this subzone would be low compared to the more developed areas, and opportunities for solitude would be good.

Development in the semi-primitive subzone would be limited to improvements to existing trails and construction of a 1.0-mile interpretive trail from Strawberry Creek to the Osceola ditch tunnel. The trail to Lexington Arch would be upgraded to provide for hiking access to this significant feature. No backcountry camps would be built. A total of 30 miles of existing trails would be rehabilitated or reconstructed, as described in the proposed action. This would include 9.4 miles to be rehabilitated, and 20.6 miles to be reconstructed or relocated.

On-site interpretive developments in the semi-primitive subzone would be limited to low-profile directional, safety, and resource protection signs. A self-guiding publication would be developed for the Lexington Arch trail, dealing with the feature's geologic origins and physical dimensions. A backcountry trail guide or guides would be developed for the Baker Lake and Johnson Lake trail systems.

**Semi-Primitive
Subzone**

The primitive subzone would encompass the majority of the park. There would be no visitor facilities and no on-site interpretive media in this subzone. Orientation, information, and interpretation would be through maps and other carry-along published materials. People seeking the highest degree of challenge and physical commitment would visit the

**Primitive
Subzone**

ALTERNATIVE A - NO ACTION/MINIMUM REQUIREMENTS

primitive subzone. Contacts would be rare, and opportunities for solitude would be great.

No maintained access or designated roadside parking areas would be provided at Big Wash, Big Spring Wash, or the Highland Ridge trailhead. Visitors could hike or drive to the park boundary on unmaintained roads. The Mt. Washington access road would be gated at the park boundary, and no public vehicular access would be provided beyond this point.

Special Use Zone	The special use zone would continue to contain the 30-foot-high television relay tower and associated concrete structure near Cedar Spur operated by the White Pine Television District and the radio repeater on Bald Mountain operated by the Forest Service.
Access for the Disabled and Elderly	Barrier-free facilities would include the desert-shrub pullout on the entrance road; the paved trail from the overflow parking area at Lehman Cave to the visitor center and the newly accessible front entrance; the paved trail at the mahogany shrub/Mt. Moriah overlook; the Wheeler Peak pullout/trailhead and parking area and the adjacent paved meadow loop trail; and two campsites at the Wheeler Peak campground.
Concession Services	The small concession would continue to operate in the Lehman Cave visitor center, providing limited food service and souvenir sales. Commercial use licenses would continue to be issued for tour group operators. Additional commercial use licenses might be issued for vehicular towing and road service, supplying firewood to campgrounds, backcountry horse trips, or other activities to serve park visitors. These licenses would not be limited in number but would be issued on a case-by-case basis.
NATURAL RESOURCE MANAGEMENT	Under alternative A, natural resources would be managed as described in the proposed action, with the following differences. <i>Grazing Management</i> - The Park Service would not significantly alter the existing distribution of livestock but would, to the extent possible, mitigate continuing impacts to riparian areas, meadows, and other sensitive resource areas. Areas above 10,500 feet in elevation would not be zoned as protected natural areas, and the Mt. Washington area would not be zoned as a research natural area. Grazing in these areas would continue to be permitted.

Fish and Wildlife Management - The Park Service would actively protect the Bonneville cutthroat trout in the streams in the northwest section of the park, but it would not reestablish the cutthroat in the streams on the east side of the park or prohibit grazing in the drainages where trout currently exist.

Under alternative A cultural resource management actions would be the same as under the proposed action, except that there would be no rehabilitation or rewatering of the historic Osceola ditch and flume.

CULTURAL RESOURCE MANAGEMENT

As stated in the proposed action, there is a potential for mining or commercial activity on patented lands (200 acres) outside the park boundary in the Mt. Washington vicinity, which would threaten the bristlecones on the claims and pose a direct threat to the park's prime bristlecone forest. A major reason for the establishment of Great Basin National Park was to provide protection for this unique forest habitat. Because the Park Service has no authority to prohibit or control commercial development on patented claims, a long-range Park Service goal should be to submit a recommendation to Congress for a boundary addition in this area and to acquire these claims on a willing-seller basis to ensure the preservation of the nationally significant bristlecone resource. Until that time, the Park Service would work with property owners and local, county and state officials to ensure protection of resource values.

LAND PROTECTION

Cooperative agreements would be established with the Forest Service and Bureau of Land Management to maintain and use the Strawberry Creek, Snake Creek, and Lexington Arch approach roads and to provide a trailhead and parking area at Lexington Arch.

ALTERNATIVE B – BACKCOUNTRY EMPHASIS

Alternative B would provide a higher degree of protection for natural and cultural resources in the park than any of the other alternatives. All park administration, maintenance, housing, and visitor center facilities would be relocated out of the Lehman Cave area to the town of Baker, and development in other park areas would be minimized. Actions proposed in this alternative would fulfill legislative mandates and provide for the health and safety of visitors and staff while promoting resource preservation and protection in large areas of the park.

ZONING RATIONALE Under alternative B the modern subzone would be smaller than in the proposed action, and more of the central and southern portions of the park would be placed in the primitive and special protection subzones. Adequate staff and funding would be provided to carry out this preservation emphasis and to encourage backcountry use in the central and southern portions of the park. Large areas would be designated as protected natural areas and research natural areas.

The acreages in each zone and subzone would be as follows:

- park development zone – 939 acres
- modern subzone – 939 acres
- natural zone – 77,983 acres
- rural subzone – 1,850 acres
- semi-primitive day use subzone – 1,441 acres
- semi-primitive subzone – 17,344 acres
- primitive subzone – 45,741 acres
- protected natural area subzone – 9,334 acres
- research natural area subzone – 2,273 acres
- special use zone – 10 acres

These acreages include the approximately 1,850 acres of land along the western park boundary adjacent to Mt. Washington that are proposed for inclusion within the park boundary (see the "Land Protection and Boundary Adjustments" section). The zoning concept is illustrated on the Alternative B – Backcountry Emphasis map.

VISITOR USE AND DEVELOPMENT This alternative would concentrate visitor use in the northern part of the park. Except for Lexington Arch, areas south of Snake Creek would be trailless and accessible to only the most hardy. There would also be fewer opportunities to

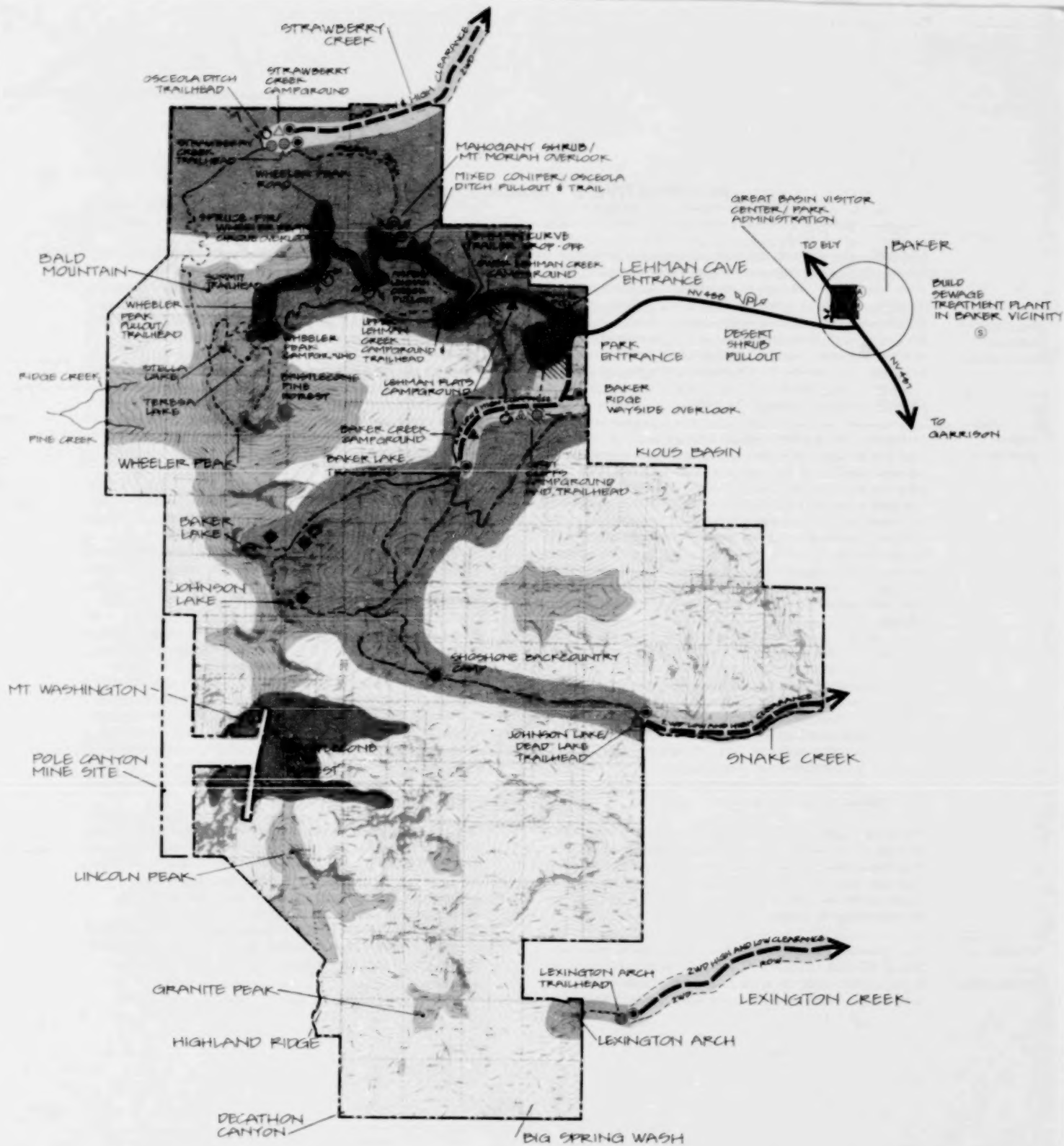
camp in the rural areas of the park, but more opportunities for hiking and horseback riding in the backcountry. Organized activities would continue to be accommodated at Lehman Cave and along the Wheeler Peak road. Orientation, information, and interpretation would be provided at the new visitor center in Baker and in the park's developed areas. Actions proposed under this alternative are illustrated on the Alternative B – Backcountry Emphasis map.

Most of the major visitor use and administrative developments would be relocated out of the park to the 80-acre site in Baker. This site and the remaining facilities in the Lehman Cave area and along the Wheeler Peak road would be included in the modern subzone. Most visitors would spend their time in this subzone, viewing and learning about the park's significant features. Facilities would be heavily frequented, and there would be few, if any, opportunities for solitude. The following specific developments and informational and interpretive facilities would be included in the modern subzone.

Modern
Subzone

Highway Exhibits. As in the proposed action, visitors' first information about Great Basin National Park would be provided at interpretive exhibit shelters on the major highways leading to the park. These exhibit shelters would introduce visitors to the Great Basin physiographic region, identify major topographic features visible from the shelters, highlight the significance of the park, and provide directions to the park and the new visitor center in Baker. The general locations for the exhibits would include US 93 southwest of the park (southwest exhibit shelter), US 50 on Sacramento Pass (north exhibit shelter), US 50 just west of the Confusion Range (east exhibit shelter), and US 21 southeast of the park (southeast exhibit shelter).

Great Basin Visitor Center/Administration Building. This new facility would replace the Lehman Cave visitor center as the park's primary interpretive/visitor contact site. It would be a full-service visitor center and would incorporate cave interpretation, Great Basin interpretation, orientation and information, and campground permit functions. All administrative functions would also be housed in this building (see the "Administrative Facilities" section for a more detailed description of this building).



ALTERNATIVE B

BACKCOUNTRY EMPHASIS

GREAT BASIN NATIONAL PARK

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Visitor Use and Development

- EXISTING PARK BOUNDARY
 - PROPOSED PARK BOUNDARY
 - RIGHT OF WAY
 - SURFACED ROAD
 - UNSURFACED ROAD
 - HIKING/HORSE TRAIL
 - HIKING TRAIL
 - PARKING AREA
 - ▲ LIMITED SERVICE CAMPGROUND
 - △ RUSTIC CAMPGROUND
 - △ GROUP CAMPGROUND
 - BACKCOUNTRY CAMPSITE
 - * VISITOR CENTER
 - ⌋ WAYSIDE PULLOUT/INTERPRETIVE EXHIBIT
 - ▽ TICKET SALES KIOSK
 - ⊗ TRAILHEAD
 - Ω CORRAL
 - ⌘ PICNIC AREA
 - (A) ADMINISTRATION
 - (M) MAINTENANCE
 - (H) HOUSING
 - (S) SEWAGE TREATMENT FACILITY
 - (W) WATER STORAGE TANK
 - ▨ DEVELOPMENT ELIMINATED/AREA REVEGETATED
- SUBZONES
- PRIMITIVE
 - PROTECTED NATURAL AREA
 - RESEARCH NATURAL AREA
 - SEMI-PRIMITIVE
 - SEMI-PRIMITIVE DAY USE
 - RURAL
 - MODERN



0 1 2 MILES
0 1 2 3 KILOMETERS

The proposed visitor center would be built on the 80-acre Baker site on the west side of Highway 487. A paved access road would lead to a 75-car 10-bus/RV parking lot with a passenger drop-off area. Parking for administrative staff would be separated from visitor parking. The building would be sited to take advantage of views to the park.

The lobby area of the visitor center would provide information, orientation, and trip-planning services to permit visitors to familiarize themselves about the park and region. However, the primary attraction in the center would be a film that would accomplish the following:

Provide a basic understanding of the Great Basin physiographic region and the park's significance as part of this landform.

Convey the message that the park is a mountain island in a desert sea (island biogeography).

Illustrate the responses of humans, plants, and animals to the stresses of this harsh environment.

Show visitors how their own actions may be contributing to global warming and how the park serves as an indicator of this trend.

The film would be presented in the 75-seat auditorium, and its message would be complemented by providing in-depth treatment of selected aspects of the Great Basin story in the nearby exhibit area. The following subjects would be the focus of interpretation:

- natural history
 - life zones and major habitats
 - island biogeography
 - climatic change
 - glacial geology
 - bristlecone pines
 - threatened species
 - topographical points of interest
 - Lehman Cave
 - geologic formation of the cave
 - cave decorations
 - interrelationship between the cave and the surface
 - cave life
- cultural history
 - native Americans in the Great Basin (past and present)

ALTERNATIVE B - BACKCOUNTRY EMPHASIS

frontier settlement
ranching and agriculture
mining (past and present)
Lehman Cave
early inhabitants and discovery of the cave
human impacts on the cave/cave conservation

Park Entrance. The existing park entrance road outside the park boundary (Highway 488) would continue to provide access to the park. The Park Service would establish a cooperative agreement with the Bureau of Land Management for use and protection of lands along this road and would seek to acquire easements from private landowners to reduce the possibility of incompatible development on lands adjacent to the road. A desert-shrub wayside pullout would be established in this right-of-way. It would be on the north side of the road and would include parking for 5 to 10 cars. A park entrance sign would be placed at the boundary, but no parking would be provided near the sign.

The park entrance road would be realigned at the existing Wheeler Peak road intersection to form a gradual curve. The Baker Creek road would intersect the Wheeler Peak road at the Wheeler Peak road intersection.

Lehman Cave. The existing Lehman Cave visitor center would be removed and replaced by the new visitor center in Baker. Access to Lehman Cave would be on a proposed 1.2-mile paved road extending south from the Wheeler Peak road. The proposed road would require construction of a small bridge across Lehman Creek. It would end at a new 70-car/30-RV parking lot, which would be designed in two levels stepped down the hillside to minimize their visual impact. The parking lot would be built on previously disturbed land near the existing picnic area. This area is in a pinyon-juniper forest setting, and islands of native vegetation would be incorporated into the parking lot; some seating and shade structures would be provided. Parking for oversized vehicles would be separated from car parking by vegetation and topography.

A picnic area with 12 to 15 tables and a cave ticket sales kiosk/staging shelter with attached restroom facilities would be constructed on the west side of the parking lot. The kiosk would include a service window and would be staffed during peak visitor use periods. The staging shelter would function as an informal gathering space for cave tours.

A new 1,000-foot paved barrier-free trail would begin at the ticket kiosk/staging shelter, wind through the pinyon-juniper

forest, pass the Rhodes cabin, and end next to the Lehman Cave entrance. The trail would incorporate seating areas and handrails. Cave access would continue to be through a man-made corridor; however, the natural cave entrance would be restored and interpreted. The first room in Lehman Cave would have barrier-free access.

The historic Rhodes cabin would be adaptively used to display new interpretive exhibits describing its original function as overnight lodging for early Lehman Cave visitors. An interpretive panel would be installed outside the cabin to inform visitors about its history. The historic Lehman orchard has recently been restored and expanded to approximately 40 trees (based on the 1990 *Orchard Management Plan*), and a water-conserving drip irrigation system installed. The orchard would be interpreted in exhibit panels along the trail to Lehman Cave. Trail access to the orchard would not be provided. The Lehman nature trail near the cave entrance would be upgraded. Interpretation of the geology and history of Lehman Cave and the history of the Rhodes cabin would continue to be provided on the trail through a self-guiding publication.

After all cave interpretation and administration functions were consolidated in Baker, the Lehman Cave visitor center and associated two-level parking lot and entrance road would be removed, and the areas recontoured and revegetated. The existing restaurant and gift sales concession would not be retained as part of the park operation.

Wheeler Peak Road. As in the proposed action, the Wheeler Peak road would be upgraded to reduce safety hazards and improve roadside pullouts. Road work would be limited to widening road shoulders and stabilizing certain portions of the roadbed. Vehicle size restrictions would be imposed for travel on the road (only vehicles less than 30 feet in length and 8 feet in width), and a 20-site trailer drop-off would be constructed at Lehman Curve to permit visitors pulling trailers to park them and travel on up the Wheeler Peak road. Visitors in oversized RVs would not be permitted past this point.

Several interpretive pullouts with exhibit panels would be established along the Wheeler Peak road, and some would include trailheads. Campgrounds would also be provided in two locations. These campgrounds would be fenced with timber pole fencing to separate sheep and cattle grazing from camping activities. All trailhead pullouts would incorporate orientation exhibits, and all campgrounds would have information shelters.

Interpretive Pullouts - All proposals for the Wheeler Peak road pullouts would be the same as under the proposed action. The mixed conifer/Osceola ditch pullout would be improved, and a paved interpretive trail constructed, to expand interpretation of the mixed conifer forest and the historic Osceola ditch. A portion of the ditch and wooden flume would be reconstructed, and exhibit panels along the trail would interpret both the life zone and the cultural feature. Parking for 5 to 10 cars would be included. At the mahogany shrub/Mt. Moriah overlook a new paved barrier-free interpretive trail and viewing platform would highlight the surrounding stand of mountain mahogany and the views of Mt. Moriah and the North Snake Range. Exhibit panels would provide interpretation. Parking for 5 to 10 cars would also be included. The aspen/Lehman Creek pullout would offer views of the Lehman Creek drainage and the upper portion of Wheeler Peak, and interpretive panels would address related natural history themes. This upgraded pullout would include 5- to 10-car parking and viewing areas that would permit visitors to see up and down the drainage as well as across the Snake Valley basin. The new spruce-fir/Wheeler Peak cirque overlook would include a 5- to 10-car paved parking area built over a retaining wall and a viewing area looking into the Wheeler Peak cirque. Interpretive panels would be placed on the retaining wall here to discuss the cirque and the spruce-fir forest. The Wheeler Peak pullout, built in connection with the Wheeler Peak trailhead, would be the last pullout along the road. It would include interpretive exhibit panels describing all of the life zones and significant points of interest in surrounding areas.

Campgrounds - A new 100-site limited-service campground would be established at Lehman Flats. As in the proposed action, this campground would include an amphitheater, paved back in sites with tent pads, picnic tables, and fire rings. Potable water and low-volume flush toilets would be available, and a dump station would be provided. Water, sewer, and electrical hookups would be installed at the site used by the campground host. Electricity would be extended to the amphitheater and toilets.

The 24-site limited-service Upper Lehman Creek campground and trailhead would be retained. Potable water and four new vault toilets would be provided. The Lower Lehman Creek campground would be removed, and the sites recontoured and revegetated.

Wheeler Peak Pullout/Tailhead. The summit and Wheeler Peak trailheads would be modified as described in the

proposed action, except that the new Wheeler Peak trailhead parking lot would only provide space for 40 cars. A 10-car parking lot would be established at the summit trailhead, and a traffic island would separate it from the main roadway; informational signs would be installed. New parking at the Wheeler Peak trailhead would be in two terraced lots in the forest northeast of the existing lot. These lots would be accessible from the Wheeler Peak road at a point approximately 300 feet beyond the existing day use parking area. They would be separated by traffic islands and screened from the main road with shrubs and trees native to the subalpine zone. All facilities at the trailhead would be wheelchair-accessible; they would include a seating area with gathering space for groups, a picnic area, orientation and interpretive exhibits, and a comfort station. A paved trail, crosswalk, and pedestrian bridge over Lehman Creek would link the parking facilities to the trails in the semi-primitive day use subzone. The existing parking area, restroom, and trailhead would be removed, and the sites recontoured and revegetated.

The existing Wheeler Peak campground would be removed, and the 37 sites would be restored to natural conditions.

Administrative Facilities. All administrative functions would be relocated from the Lehman Cave visitor center to the proposed visitor center/administration building on the 80-acre site in Baker. The building would be approximately 8,000 to 10,000 square feet and would include a lobby and sales area, an auditorium, exhibit space, restrooms, all staff offices, conference rooms, a library, curatorial space, records space, and storage. Parking for 25 staff vehicles would be provided in the lot separated from visitor parking.

All maintenance facilities and functions, including the fire cache and fire truck, would be relocated to a 5-acre maintenance compound at the Baker site. As in the proposed action, this compound would include a 2,500-square-foot building with office, support rooms, and shops; a 10,000-square-foot vehicle storage building; a 3,000-square-foot warehouse; and outdoor storage space. The emergency generator in the park would be relocated behind the Lehman Cave ticket sales kiosk/staging shelter.

All housing would also be relocated out of the park, and 11 to 15 new single-family houses and 25 to 30 apartment units would be built at the Baker site. The new residential area would be designed as described in the proposed action and would include a community playground.

ALTERNATIVE B - BACKCOUNTRY EMPHASIS

The existing sewage treatment ponds in the park are inadequate to handle the demands of increasing visitation and necessary support services and are visible from several major viewing points in the park. In cooperation with the state of Nevada and the town of Baker, the Park Service would develop a new wastewater treatment plant in the Baker vicinity. Funding for construction and operational costs might be shared by the state and federal government to provide a facility that would serve the needs of the park and the community of Baker. A new wastewater system would be developed to carry effluent from the Lehman Cave facilities and the Lehman Flats campground to the proposed sewage treatment plant in the Baker vicinity. The existing park sewage treatment ponds and gravel access roads would be removed following construction of the new treatment facility, and the areas would be restored to natural conditions.

Water wells would be drilled at the Baker site to provide water to the 40 residences, the maintenance facilities, and the visitor center/administration building. The water storage system in the park would be maintained at its existing 100,000-gallon storage capacity.

An underground electrical distribution system would provide power to the Baker site.

Following relocation of all functions to the Baker site, the existing housing, maintenance, and visitor center areas, the sewage lagoons, and the gravel pit in the park would be reclaimed and restored to natural conditions.

Rural Subzone

The rural subzone would be less extensive under this alternative than under the proposed action, and the focus would be on access for hiking and horseback riding rather than overnight camping. There would be no designated campsites in the rural subzone in the southern half of the park. Contacts in this subzone would be fairly frequent, but there would be some opportunities for solitude.

Five park areas would contain rural subzone developments - Strawberry Creek, Baker Creek, the lower reaches of Snake Creek and Lexington Creek, and a small portion of Decathlon Canyon. Gravel roads would provide access to these areas. All rural subzone destinations except Decathlon Canyon would have trailheads - some with horse corrals - and areas in the northern part of the park would include rustic campgrounds. All trailheads would incorporate orientation exhibits, and all campgrounds would have information shelters. Campsites would be surfaced with crushed limestone and have some type of perimeter definition to limit

damage to the surrounding environment. Corrals would be constructed of timber poles and would include water troughs and primitive mangers for hay and feed.

The Park Service would obtain rights-of-way from the Bureau of Land Management and Forest Service for access on the Strawberry Creek, Snake Creek, and Lexington Arch approach roads to the park boundary. The rights-of-way would extend 200 feet on each side of the road centerline. The Park Service would upgrade and maintain the roads.

Strawberry Creek. Existing campsites along the access road into Strawberry Creek would be removed, and the areas revegetated. All camping in this part of the park would be confined to a new 15-site cluster campground at the west end of the creek. The campground would have 15 picnic tables, 15 fire grates, and three vault toilets. A backcountry trailhead, orientation exhibit, corral, and 10-car gravel parking area would be included in this development to provide access to Upper Strawberry Creek, Windy Canyon, Blue Canyon, and the new Osceola tunnel interpretive trail. A separate 10-car gravel parking area and trailhead would be constructed in the area to provide access to the southern portion of the Osceola ditch trail for hikers only. All of the trails in the Strawberry Creek vicinity would be in the semi-primitive subzone. Horseback riding would be confined to Strawberry Creek, Windy Canyon, Blue Canyon, and the Osceola tunnel interpretive trail.

The 6-mile Strawberry Creek access road would be upgraded from dirt to two-wheel-drive gravel from US 6/50.

Baker Ridge/Baker Creek. The Baker Ridge/Baker Creek area would be designated as part of the rural subzone. It would include two campgrounds, several trailheads, and a new wayside overlook on Baker Ridge. The overlook would be accessible from the Baker Creek road along a gravel road leading to a 15- to 20-car gravel parking lot. A picnic area with 8 to 10 tables would be established in the pinyon-juniper forest nearby. A hardened barrier-free trail with resting places would provide access from the parking area to the overlook. The overlook would be in a saddle on Baker Ridge, offering distant views of basins and ranges and closer views of the northern portion of the Snake Range. An exhibit cluster containing two to four interpretive panels would be developed for the site. Exhibits would focus on the Great Basin story and the topographic, natural, and cultural features visible from the site.

Three of the four loops at the existing Grey Cliffs campground would be removed; the upper loop would be converted for group camping, with a gravel access road, six pull-ins, 12 picnic tables, six fire grates, and two vault toilets. No potable water or electricity would be provided. A trailhead and corral would be developed in the Grey Cliffs area for hiking and equestrian access to the Baker Creek and Baker Lake trail systems.

The existing 32-site limited-service Baker Creek campground would continue to accommodate tent, RV, and trailer camping, and the gravel campground roads would be maintained. Four new vault toilets would be provided. Potable water would be available.

A 10-car gravel parking area would be constructed at the existing Baker Lake trailhead. This trailhead would provide access for hikers and horseback riders to the Baker Lake, Lehman Creek, and Baker Creek trail systems.

The Baker Creek road would be maintained as a two-wheel-drive gravel road.

Snake Creek. Approximately 1½ miles of the existing 12-mile dirt access road within the park boundary would be upgraded to a two-wheel-drive gravel road. This road would end at a new 15-car gravel parking lot and backcountry trailhead providing access to Johnson Lake, Dead Lake, and the Baker Lake trail system. Camping would not be permitted on Snake Creek under this alternative. Existing campsites and the roadway between the parking lot and the Shoshone backcountry campground would be allowed to revegetate and would be included in the semi-primitive subzone.

Lexington Arch. The existing 11-mile dirt entrance road to Lexington Arch would be upgraded to a two-wheel-drive gravel road and maintained by the Park Service. A 10-car gravel parking area and trailhead would be established on the road about a mile east of the park boundary. The trailhead would provide hiking access to the arch, which would be included in the semi-primitive subzone.

Decathon Canyon. The road through Decathon Canyon crosses the extreme southwestern boundary of the park. The portion of this unmaintained road that crosses NPS land would remain open to hunters wishing access to Forest Service lands farther up the canyon. The road would be gated where it reenters the park at the north end of the canyon.

As in the other alternatives, the semi-primitive day use subzone would encompass the Wheeler Peak day use area, where a system of hiking trails would provide access to the subalpine lakes, bristlecone pine forest, glacier, rock glacier, and Wheeler Peak. Interpretive exhibit panels and low-profile directional and safety signs would be provided. Contacts here would be moderately frequent, and visitors would have few opportunities for solitude.

Semi-Primitive
Day Use
Subzone

Trail maintenance, rehabilitation, reconstruction, and interpretation would be carried out in the Wheeler Peak area as described in the proposed action. Of the 4.5 miles of existing trails, 0.9 mile would be maintained, 1.5 miles would be rehabilitated, and 2.1 miles would be reconstructed or relocated. One new trail would be constructed – the 0.1-mile barrier-free Wheeler Peak meadow loop trail described in the proposed action. This trail would be routed through spruce forest, meadow, and streamside areas, and wayside exhibit panels would provide interpretation of natural resources along the trail route. Orientation exhibits would be established at all trailheads for the Wheeler Peak trail systems. Visitors could take ranger-guided interpretive walks or explore these areas on self-guiding interpretive trails of varying degrees of difficulty.

The semi-primitive subzone would be extensive under this alternative and would encompass large tracts in the northern and central parts of the park. It would include most of the Strawberry Creek/Osceola ditch vicinity, the lands south of Lehman Creek and west of Baker Creek, the large area including the Baker Lake/Johnson Lake trail system and extending southeast to Snake Creek, and the land surrounding Lexington Arch. There would be numerous opportunities to explore these areas on well-maintained trails. A few campsites would be designated. Contacts in this subzone would be infrequent, and visitors would be able to experience its attractions in relative seclusion.

Semi-Primitive
Subzone

A total of 32.2 miles of existing trails would be rehabilitated or reconstructed, as described in the proposed action. This would include 9.4 miles to be rehabilitated and 22.8 miles to be reconstructed or relocated. Four new trails totaling 10.4 miles would be constructed to link various features and drainages in the northern and central parts of the park – the Strawberry Creek/Wheeler Peak trail, the Osceola tunnel interpretive trail, the Lehman Creek/Baker Creek trail, and the Pole Canyon/Baker Creek trail. These trails and the terrain they would pass through are described in more detail in the proposed action.

ALTERNATIVE B - BACKCOUNTRY EMPHASIS

The existing Shoshone campground on Snake Creek would be redesigned to function as a backcountry camp. The parking logs and outhouses would be removed, and six sites would be retained. Low-profile signs at the campground would direct hikers to the Johnson Lake and Dead Lake areas, and self-guiding publications would provide interpretation of the significant natural and cultural features along the way. Three additional backcountry campgrounds would be provided in the semi-primitive subzone: one at Johnson Lake, one at Baker Lake, and one below Baker Lake (with a corral). Campsites would have tent pads with perimeter definition. Wood fires would be prohibited at campgrounds in alpine and subalpine areas. If camping demand exceeded the number of campsites, overnight camping permits would be issued for some of the areas to regulate use.

On-site interpretation in the semi-primitive subzone would be limited to low-profile directional, safety, and resource protection signs. Self-guiding publications would be developed to provide information about and interpretation of resources associated with backcountry trails. The publications would include route maps, safety information, and interpretation of cultural and natural features.

Primitive Subzone

Large areas in the central and southern parts of the park would be included in the roadless and trailless primitive subzone. As in the other alternatives, there would be no visitor facilities and no on-site interpretive media in this subzone. Orientation, information, and interpretation would be through maps and other carry-along published materials. People seeking the highest degree of challenge and physical commitment would be attracted to the primitive subzone. Contacts would be rare, and opportunities for solitude would be great.

No maintained access or designated roadside parking areas would be provided at Big Wash, Big Spring Wash, or Highland Ridge. Visitors could hike or drive to the park boundary along unmaintained roads. The Mt. Washington access road would be gated at the boundary, and no public vehicular access would be provided beyond this point.

Research Natural Area and Protected Natural Area Subzones

The research and protected natural area subzones would be managed the same as the primitive subzone except that grazing would be prohibited to protect sensitive alpine plant species. As under the proposed action, the research natural area subzone would include the stand of bristlecone pines in the southwestern part of the park, and the protected natural area subzone would encompass large areas of fragile alpine

tundra. Management actions in both of these subzones would focus on resource protection and monitoring. No roads or other developments, except low-standard trails, would be allowed. Visitor experiences in these areas would be similar to those in the primitive subzone, except that camping would be prohibited.

The special use zone would continue to contain the 30-foot-high television relay tower and associated concrete structure near Cedar Spur operated by the White Pine Television District and the radio repeater on Bald Mountain operated by the Forest Service.

Special Use Zone

Barrier-free facilities would include the desert-shrub pullout, the hard-surfaced trail to the Baker Ridge overlook and picnic area, the paved trail from the Lehman Cave parking area to the cave entry, the paved trail and viewing platform at the mahogany shrub/Mt. Moriah overlook, the aspen/Lehman Creek pullout, the spruce-fir/Wheeler Peak cirque overlook, and the proposed Wheeler Peak pullout/trailhead and parking area and the adjacent paved meadow loop trail.

Access for the Disabled and Elderly

The present Lehman Cave concession operation would be removed. Private enterprise would be encouraged to provide similar services in the park vicinity.

Concession Services

Commercial use licenses would continue to be issued for tour group operators. Additional commercial use licenses might be issued for vehicular towing and road service, supplying firewood to campgrounds, backcountry horse trips, or other activities to serve park visitors. These licenses would not be limited in number but would be issued on a case-by-case basis.

Natural resources would be managed as described in the proposed action, with the following differences.

NATURAL RESOURCE MANAGEMENT

Threatened, Endangered, and Sensitive Species - The Park Service would prohibit grazing in all areas with sensitive plant species as well as in the protected natural area and research natural area subzones. This would primarily be the high elevation alpine/subalpine areas above 10,500 feet, but would also include small additional areas at lower elevations.

Fish and Wildlife Management - The Park Service would actively work to reestablish Bonneville cutthroat trout into all streams on the east side of the park that

are believed to have historically contained this species. This would require the elimination of all nonnative fish in all east-side streams and lakes. The Park Service would also actively protect the existing Bonneville cutthroat trout populations in the streams in the northwest section of the park.

If additional research confirmed that elk were once resident to the lands within the park, the Park Service would actively seek to reintroduce this species to the South Snake Range.

**CULTURAL
RESOURCE
MANAGEMENT**

Under alternative B cultural resource management actions would be the same as described in the proposed plan.

**LAND
PROTECTION
AND
BOUNDARY
ADJUSTMENTS**

Land protection actions for the Spring Valley and Snake Valley basins and the regional exhibit shelter sites would be the same as under the proposed action. In addition, the following boundary expansion would be undertaken in the Mt. Washington area.

About 1,850 acres would be added to the park along the western boundary adjacent to Mt. Washington, eliminating the irregular boundary alignment referred to as the "keyhole." The present boundary alignment excludes large areas of bristlecone pine near the summit of Mt. Washington and along Lincoln Canyon ridge. The boundary change would provide increased protection for this significant bristlecone stand, including many ancient individual trees. It would also extend protection to significant Rocky Mountain bighorn sheep habitat.

The boundary recommendation would involve the transfer of surface lands from the Forest Service to the Park Service. It would also include the long-range goal of acquiring all of the valid unpatented and patented mining claims on the 1,850-acre parcel to eliminate the potential for mining or commercial activity along this escarpment, which would irreparably damage the bristlecone pine resource in this area and could create intrusions or scars on the landscape that would be visible from the park. Under the park's enabling legislation, the acquisition of valid unpatented and patented claims would be on a willing-seller basis only.

Rights-of-way would be obtained from the Bureau of Land Management and the Forest Service for access to the park along the Strawberry Creek, Snake Creek, and Lexington Arch approach roads. The rights-of-way would extend 200 feet of each side of the road centerlines; their exact mileages are shown in table 18 in the impacts of alternative B section. The Park Service would be responsible for upgrading and maintaining the roads within these rights-of-way.

A cooperative agreement would be established with the Forest Service for the development and use of the parking area/trailhead at the end of the Lexington Arch approach road.

ALTERNATIVE C - ACCESS EMPHASIS

Alternative C would make more areas of the park accessible by car or four-wheel-drive vehicle and would correspondingly reduce the areas set aside for isolated, primitive experiences. Hiking and horse trails would extend into most backcountry areas, and new campgrounds and campsites would be designated. Interpretive opportunities would be expanded in the southern portions of the park, and visitors would have many options for viewing and learning about park resources and the Great Basin physiographic region. Opportunities for solitude would decrease under this alternative, and resource protection activities would be more difficult because of the numbers of visitors in areas with sensitive resources.

ZONING RATIONALE

Under alternative C modern and rural subzone areas would extend along the entire length of the park's eastern boundary, and three semi-primitive day use subzones would be established to encourage visitors to use the northern, central, and southern portions of the park, including the Mt. Washington area. An expanded backcountry trail system in the semi-primitive subzone would allow visitors to traverse the park from north to south. The primitive subzone would be limited to a few remote and isolated areas. No protected natural area or research natural area subzones would be designated. The following acreages would be included in each zone and subzone:

- park development zone - 2,000 acres
- modern subzone - 2,000 acres
- natural zone - 75,072 acres
- rural subzone - 1,395 acres
- semi-primitive day use subzone - 3,847 acres
- semi-primitive subzone - 47,650 acres
- primitive subzone - 22,180 acres
- special use zone - 10 acres

The zoning concept is illustrated on the Alternative C - Access Emphasis map.

VISITOR USE AND DEVELOPMENT

Alternative C would involve the most extensive development of the park. Paved access would be provided into the Kioux Basin, Baker Creek, and Snake Creek areas as well as to Lehman Cave and the Wheeler Peak day use area. Access would also be opened to four-wheel-drive vehicles on the west side of the park in the Mt. Washington area.

Interpretation and trail access would be expanded, and facilities would be fairly widespread.

Development in the modern subzone would be similar to that in the proposed action, except that the new Great Basin visitor center would be in Kioux Basin rather than on Baker Ridge and the new Wheeler Peak Scenic Drive would pass through a different part of the basin area. In addition, access into the Snake Creek area would be paved, and camping opportunities there would be expanded. Other actions would include building a Baker orientation center, redesigning the Lehman Cave visitor center, and improving facilities on Wheeler Peak Scenic Drive, in the Wheeler Peak day use area, and in Baker Creek. Most park operations would remain in the park under this alternative; only the sewage treatment ponds would be relocated outside the boundary. The following specific developments and services are proposed.

Highway Wayside Exhibits/Baker Orientation Center

Visitors' first information about Great Basin National Park would be provided at interpretive exhibit shelters on the major highways leading to the park. These exhibit shelters would introduce visitors to the Great Basin physiographic region, identify major topographic features visible from the shelters, highlight the significance of the park, and provide directions to the park and the new orientation center in Baker. The general locations for the exhibits would include US 93 southwest of the park (southwest exhibit shelter), US 50 on Sacramento Pass (north exhibit shelter), US 50 just west of the Confusion Range (east exhibit shelter), and US 21 southeast of the park (southeast exhibit shelter).

The orientation center would be built on a small portion of the 80-acre site west of Highway 487 and north of the existing park entrance road in Baker. The building would be of the same size and configuration as the orientation center described in the proposed action (500 square feet, with a service window and restrooms). Barrier-free access would be provided from a 25-car/5-RV parking lot, and drinking water would be available. The orientation center would offer detailed information about the park and more general information about the Great Basin physiographic region. It would be designed for both staffed and unstaffed operation, and it might also be used to issue camping permits.

Modern
Subzone

Wheeler Peak Scenic Drive/New Park Entrance. After leaving the orientation center, most visitors would drive 1.9 miles south on Highway 487 to the entrance of Wheeler Peak Scenic Drive. A new 7-mile extension of the existing Wheeler Peak road would become the eastern portion of the scenic drive. This extension would be designed to provide unique interpretive experiences, introducing visitors to a variety of terrains and life zones and arousing their curiosity and anticipation. The scenic drive would pass through three life zones before crossing the park boundary and would provide views of both basin and range environments. Within the park it would provide access to the new Great Basin visitor center at Kiou Basin and would continue on to the Wheeler Peak pullout/trailhead. The design of the new scenic drive would be similar to that of the proposed action except that the first 4 miles would be aligned to pass through Kiou Basin.

As in the proposed action, the existing entrance road would be gated at the park boundary. Residents living along the road outside the park would still be able to reach their properties on this county-maintained road.

The entire length of the new scenic drive east of the park boundary would traverse public lands, eliminating the need to acquire land or scenic easements. The Park Service would obtain rights-of-way from the Bureau of Land Management and the Forest Service to construct the first 6 miles of the road within an 800-foot corridor on BLM land and to cross slightly over 1 mile of Forest Service land (section 14) just east of where the scenic drive would enter the park. The entire scenic drive would be maintained by the Park Service, with no additional expense or responsibility placed on White Pine County, the Nevada Department of Transportation, the Bureau of Land Management, or the Forest Service.

As in the proposed action, a park entrance pullout would be established near the intersection of the scenic drive and Highway 487. A new entrance sign would be incorporated into the pullout, and interpretive panels would introduce visitors to the life zone concept that would be illustrated along the scenic drive. Five other interpretive pullouts would be established on the scenic drive between Highway 487 and the park boundary – the desert shrub, Kiou Basin, riparian shrub, contemporary ranching, and pinyon-juniper pullouts. These barrier-free pullouts would provide interpretation of the surrounding life zones and natural and cultural features. Parking lots sizes and pullout designs would be the same as in the proposed action.

Great Basin Visitor Center. About 4 miles up the scenic drive visitors would come to the east side of Kiou Basin. This scenic area of granite outcroppings would provide the site for the new Great Basin visitor center. The new visitor center would serve as the park's primary interpretive facility. It would be a full-service facility, with orientation and trip planning services as well as a wide range of media, including films, audiovisuals, exhibits, and interpretive publications.

The visitor center would be just north of the entrance road in a desert shrub setting. A short paved road would provide access to a 50-car, 5-bus/RV parking area with a passenger drop-off. A paved, barrier-free pathway would lead from the drop-off area to the visitor center entry court. The design and function of the visitor center would be similar to that of the Baker Ridge visitor center in the proposed action – a 5,000-square-foot, barrier-free building with a lobby, auditorium, exhibit space, office and work space, restrooms, and a large viewing deck on the north and east sides. Spaces would be designed and laid out as described in the proposed action.

The lobby area of the visitor center would provide information, orientation, and trip-planning services to permit visitors to familiarize themselves about the park and region. However, the primary attraction in the center would be a film that would accomplish the following:

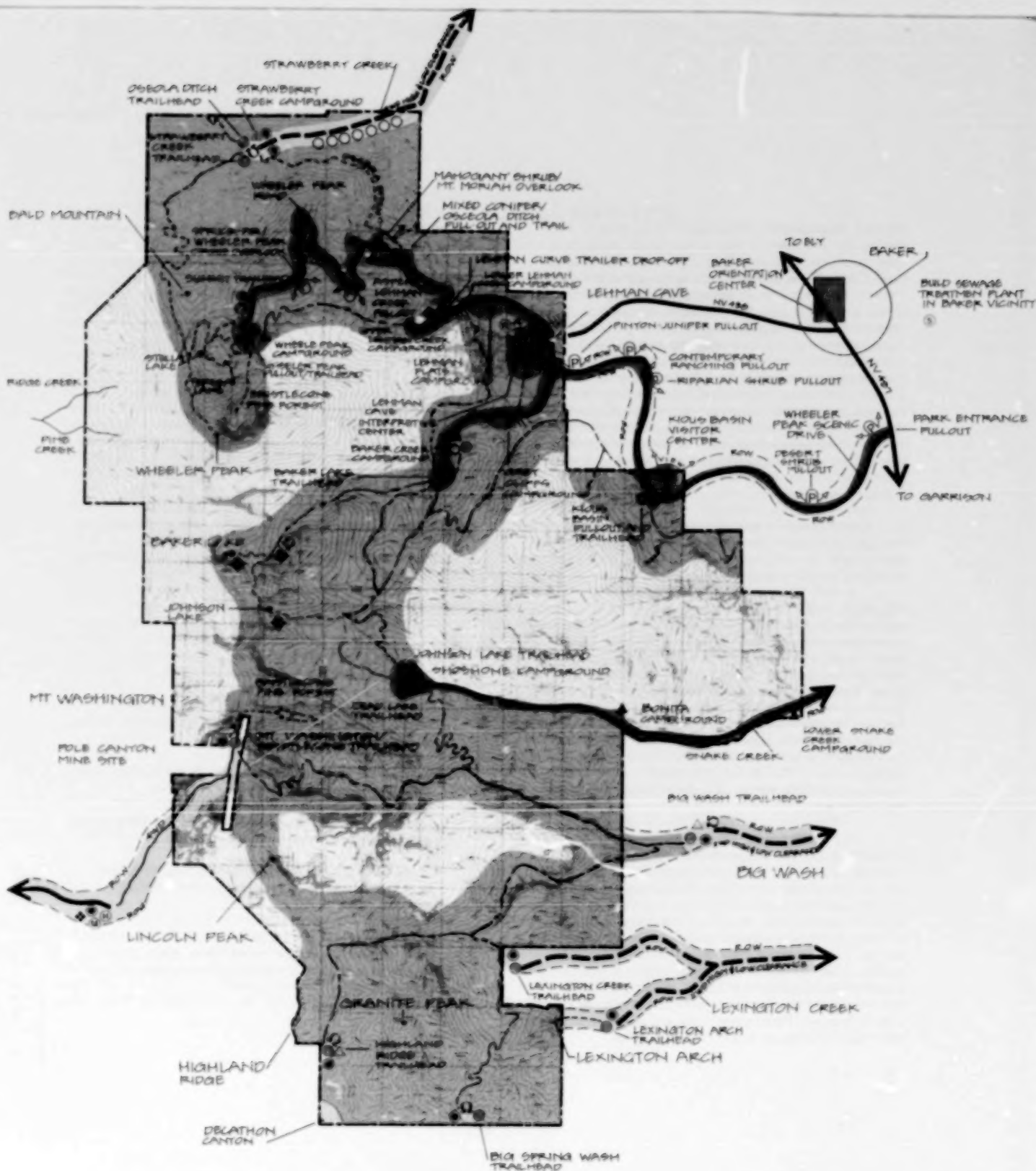
- Provide a basic understanding of the Great Basin physiographic region and the park's significance as part of this landform.

- Convey the message that the park is a mountain island in a desert sea (island biogeography).

- Illustrate the responses of humans, plants, and animals to the stresses of this harsh environment.

- Show visitors how their own actions may be contributing to global warming and how the park serves as an indicator of this trend.

The film's message would be complemented by an in-depth treatment of selected aspects of the Great Basin story in the nearby exhibit area. The following subjects would be the focus of interpretation:



ALTERNATIVE C

ACCESS EMPHASIS

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

148 • 20054 • DSC • SEPT 91

Visitor Use and Development

- EXISTING PARK BOUNDARY
 - RIGHT OF WAY
 - SURFACED ROAD
 - UNSURFACED ROAD
 - FOUR WHEEL DRIVE ROUTE
 - HIKING/HORSE TRAIL
 - HIKING TRAIL
 - PARKING AREA
 - ▲ LIMITED SERVICE CAMPGROUND
 - △ RUSTIC CAMPGROUND
 - △ GROUP CAMPGROUND
 - RUSTIC CAMPSITE
 - BACKCOUNTRY CAMPSITE
 - * VISITOR CENTER
 - ◆ INTERPRETIVE CENTER
 - ◆ ORIENTATION CENTER
 - Ⓜ WAYSIDE PULLOUT/INTERPRETIVE EXHIBIT
 - ▽ TICKET SALES KIOSK
 - ⊙ TRAILHEAD
 - Ω CORRAL
 - ⌘ PICNIC AREA
 - Ⓐ ADMINISTRATION
 - Ⓜ MAINTENANCE
 - Ⓜ HOUSING
 - Ⓢ SEWAGE TREATMENT FACILITY
 - Ⓢ WATER STORAGE TANK
 - /// DEVELOPMENT ELIMINATED/AREA REVEGETATED
- SUBZONES
- PRIMITIVE
 - SEMI-PRIMITIVE
 - SEMI-PRIMITIVE DAY USE
 - RURAL
 - MODERN



natural history

life zones and major habitats
island biogeography
glacial geology
bristlecone pines
threatened species
topographical points of interest

cultural history

native Americans in the Great Basin
(past and present)
frontier settlement
ranching and agriculture
mining (past and present)

On the outdoor viewing deck visitors would be able to associate the subjects in the Great Basin film and exhibits with the panorama of Mt. Moriah, the northern portion of the South Snake Range, and Snake Valley. A path would connect the viewing deck with the entry court so that visitors could return to the parking area without passing through the visitor center.

The Kious Basin pullout/trailhead would be developed near, but separate from, the visitor center. The pullout/trailhead would be accessible along a separate short spur road from the scenic drive and would include short- and long-term parking, interpretive panels, and trail orientation exhibits. The trailhead would provide access to the proposed Kious Basin trail system, which would be established on existing jeep paths and along hillsides. This trail system would extend across lands outside the park boundary to connect with the Baker Creek trail. The trails would be included in the semi-primitive subzone.

Baker Creek. From the visitor center, people would travel on up the scenic drive to the park boundary. Three interpretive pullouts would be along this section of road. Just inside the park boundary the scenic drive would intersect with the Baker Creek road, which would provide access to the Grey Cliffs campground, the Baker Creek campground, and the Baker Lake trailhead. The entire length of the Baker Creek road would be paved to reduce dust and required maintenance.

Three of the four loops at the Grey Cliffs campground would be removed; the upper loop would be converted for group camping, with a new paved access road, six paved pull-ins, 12 picnic tables, six fire grates, and two vault toilets. No potable water or electricity would be provided.

0 1 2 MILES
0 1 2 3 KILOMETERS

The 32-site limited-service Baker Creek campground would continue to accommodate tent, RV, and trailer camping. The gravel campground roads would be paved, and four new vault toilets would be provided. Potable water would be available. A corral and trailhead would be constructed at this campground to provide access to the Baker Creek and Kious Basin trail systems.

A paved parking area for 20 cars would be constructed at the Baker Lake trailhead. The trailhead would provide access to the Baker Lake loop system and connecting trails as well as to Lehman Creek, Baker Creek, and Kious Basin.

Lehman Cave. Past the Baker Creek road intersection, the scenic drive would be realigned to create a gradual curve (see the "Road Modifications" section below). Access from the scenic drive to Lehman Cave area would be along a new 1/2-mile paved access road extending south to a new terraced 70-car, 30-bus/RV parking lot on the site of the existing picnic area. A new picnic area and cave ticket sales kiosk would be included nearby, and a paved barrier-free trail would extend from the parking lot to the interpretive center entrance. The design of these facilities would be the same as described in the proposed action. The existing lower parking lot and entrance road northeast of the visitor center would be removed; the upper lot would be retained for disabled visitors and emergency and service vehicle parking.

As in the proposed action, the existing Lehman Cave visitor center would be redesigned to function solely as a cave interpretive center. Except for two interpretive staff offices, administrative functions would be relocated to a new administration building next to the proposed Lehman Cave parking lot (see the "Administrative Facilities" section). The interpretive center interior would be redesigned to provide adequate space for cave exhibits, an auditorium for films and interpretive programs, a lobby with seating and spaces for book browsing and book sales, an interpretive workroom, and restrooms. The following cave themes would be illustrated using a variety of media:

- geologic formation of the cave
- cave decorations
- human impacts on the cave/cave conservation
- interrelationships between the cave and the surface cave life
- early inhabitants and the discovery of the cave

The existing concession facility in the interpretive center would be retained. The exterior of the building would remain unchanged except that the entry area would be redesigned to provide barrier-free access.

Other actions would be the same as in the proposed action, including using the Rhodes cabin to house exhibits on the cabin's early history, reestablishing the historic Lehman orchard, and upgrading the Lehman trail for self-guiding interpretation.

Road Modifications - Baker Ridge/Lehman Cave Area.

The changes to the scenic drive in this area would be similar to those under the proposed action. The portion of the drive between the Baker Creek and Lehman Cave spur roads would incorporate segments of the existing Baker Creek and Wheeler Peak roads, but it would be realigned to form a gradual curve and eliminate two 90 degree turns. About 1/2 mile of new road and a bridge over Lehman Creek would be constructed. These road improvements would simplify the major road configuration in the park and provide an improved park entry experience.

The scenic drive and the Baker Creek and Lehman Cave spur roads, including all associated access roads to developed areas, would be paved. All intersections, entrances, and pullouts would be designed to safely accommodate traffic flow. Following road realignment, all abandoned road sections would be restored to natural conditions.

An old road alignment extending west from the Baker Creek spur road would be paved to provide access to the NPS housing and maintenance areas south of the Lehman Cave interpretive center. The existing housing access road in front of the interpretive center, along with the existing Lehman Cave entrance road and lower parking lot, would be removed and replanted with native species.

Continuation of Wheeler Peak Scenic Drive. Actions to be taken along this road would be the same as in the proposed action, except that the size of some facilities would be increased. Road improvements would be undertaken to reduce safety hazards and improve interpretive pullouts. Vehicle size restrictions would be imposed for travel on the road (only vehicles less than 30 feet in length and 8 feet in width), and a 20-site trailer drop-off would be constructed at Lehman Curve to permit visitors pulling trailers to park them and travel on up Wheeler Peak Scenic Drive. Visitors in oversized RVs would not be permitted past this point.

Interpretive Pullouts -- All proposals for the Wheeler Peak Scenic Drive pullouts would be the same as under the proposed action. The mixed conifer/Osceola ditch pullout would be improved, and a paved interpretive trail constructed, to expand interpretation of the mixed conifer forest and the historic Osceola ditch. A portion of the ditch and wooden flume would be reconstructed, and exhibit panels along the trail would interpret both the life zone and the cultural feature. Parking for 5 to 10 cars would be included. At the mahogany shrub/Mt. Moriah overlook a new paved barrier-free interpretive trail and viewing platform would highlight the surrounding stand of mountain mahogany and the views of Mt. Moriah and the northern portion of the Snake Range. Exhibit panels would provide interpretation. Parking for 5 to 10 cars would also be included. The aspen/Lehman Creek pullout would offer views of the Lehman Creek drainage and the upper portion of Wheeler Peak, and interpretive panels would address related natural history themes. This upgraded pullout would include 5- to 10-car parking, a low retaining wall, and viewing areas that would permit visitors to see up and down the drainage. The new spruce-fir/Wheeler Peak cirque overlook would include 8- to 10-car paved parking and a viewing area overlooking the Wheeler Peak cirque. Interpretive panels would be placed on the retaining wall here to discuss the cirque and the spruce-fir forest. The Wheeler Peak pullout, built in connection with the Wheeler Peak trailhead, would be the last pullout along the road. It would include interpretive exhibit panels describing all of the life zones and significant points of interest in surrounding areas.

Campgrounds -- A new 125-site limited-service campground would be established at Lehman Flats. This campground would include an amphitheater, paved back-in sites with tent pads, picnic tables, and fire rings. Potable water and low-volume flush toilets would be available, and a dump station would be provided. Water, sewer, and electrical hookups would be installed at the site used by the campground host. Electricity would be extended to the amphitheater and toilets.

The 24-site Upper Lehman Creek campground and trailhead would be retained. Potable water and four new vault toilets would be provided. The Lower Lehman Creek campground would be removed, and the sites recontoured and revegetated.

Wheeler Peak Pullout/Trailhead. The summit and Wheeler Peak trailheads would be modified as described in the proposed action. A 10-car parking lot would be established

at the summit trailhead, and a traffic island would separate it from the main roadway; orientation exhibits would be installed. New parking at the Wheeler Peak trailhead would be in two terraced lots in the open canopy forest northeast of the existing lot. These lots would be accessible from Wheeler Peak Scenic Drive at a point approximately 300 feet beyond the existing day use parking area. They would be separated by traffic islands and screened from the main road with shrubs and trees native to the subalpine zone. All facilities at the trailhead would be wheelchair-accessible and would include a seating area with gathering space for groups, a picnic area, interpretive panels and orientation exhibits, and a comfort station. A paved trail, pedestrian crosswalk, and pedestrian bridge over Lehman Creek would link the parking facilities to the trails in the semi-primitive day use subzone. The existing parking area, restroom, and trailhead would be removed, and the sites recontoured and revegetated.

The existing 37-site Wheeler Peak campground would be retained. Two sites would be redesigned for use by disabled visitors, and barrier-free vault toilets would be provided. Potable water would be available.

Snake Creek. Under alternative C the Snake Creek road would be paved from Highway 487 to the Shoshone campground -- a distance of 12 miles. Three limited-service cluster campgrounds, each with 10 sites, would be established along the creek -- the Lower Snake Creek, Bonita, and Shoshone campgrounds. Picnic tables, fire grates, information shelters, and vault toilets would be provided at the campgrounds. Tent sites would have perimeter definition and paved parking pads. A corral would be provided near the Shoshone campground. Ten-car paved parking areas would be provided at the Johnson Lake and Dead Lake trailheads.

Administrative Facilities. Administrative facilities would be expanded within the park boundary as described in alternative A. A new 3,000-square-foot administration building with office space, two conference rooms, a lobby, a library, curatorial and records space, storage space, and restrooms would be built adjacent to the proposed Lehman Cave parking lot. A paved spur road would lead from the interpretive center spur road to the administration building parking lot. Parking would be screened by pinyon-juniper vegetation.

A new sewage treatment plant would be developed in the Baker vicinity (see below), and the sewage lagoons in the

park would be removed. After these actions were completed, all maintenance facilities (including the fire truck and fire cache) would be relocated to a 5-acre area on the existing sewage lagoon site. The maintenance complex would include a 2,500-square-foot building with office, support rooms, and shops; a 10,000-square-foot vehicle storage building; a 3,000-square-foot warehouse; a 500-square-foot fire cache; and outdoor storage space. The emergency generator would be relocated to a site near the cave ticket sales kiosk and parking lot. The entire maintenance area would be landscaped with berms and vegetation that incorporate fencing to provide security and visual screening from Wheeler Peak Scenic Drive. Access to the area would be along an old road alignment from the Baker Creek spur road. Structures in the existing maintenance area would be removed, and the area reclaimed.

Park housing would be expanded in the existing housing area. Three to six new housing units and 20 to 30 apartments would be built along an old road alignment on the south side of the existing development. Four existing trailers would be removed and replaced with permanent structures. New housing would be designed to optimize solar efficiency and water conservation. Housing units would be clustered around common lawn areas, which would serve as recreation areas for park staff and their families. Access to the housing area would also be on the old road alignment from the Baker Creek spur road.

The existing sewage treatment ponds in the park are inadequate to handle the demands of increasing visitation and necessary support services and are visible from several major viewing points in the park. In cooperation with the state of Nevada and the town of Baker, the Park Service would develop a new sewage treatment plant in the Baker vicinity. Funding for construction and operational costs might be shared by the state and federal government to provide a facility that would serve the needs of the park and the community of Baker. A new wastewater system would be developed to carry effluent from the Kious Basin visitor center, the Lehman Cave interpretive center, the administration, maintenance, and housing facilities, and the Lehman Flats campground to the proposed sewage treatment plant in the Baker vicinity. The existing park sewage treatment ponds would be removed following construction of the new treatment plant, and the proposed maintenance facility would be built on the site.

A water well or wells would be drilled at the Baker site to provide water to the Baker orientation center. An additional

100,000-gallon water tank would be installed at the Cave Spring water storage site in the park to double the existing storage capacity to 200,000 gallons. This would provide a greater peaking capacity for the water supply to meet anticipated demands. The existing road to the water storage tanks would be maintained.

An underground electrical distribution system would provide power to the Baker orientation center and sewage treatment plant as well as the Kious Basin visitor center. Electrical lines in the new park housing area and between the Lehman Cave interpretive center and administration building would be buried.

Under alternative C rural subzone areas would serve as gateways to a parkwide trail system in the semi-primitive and semi-primitive day use subzones. Trail access would be established on both the east and west sides of the park, and trailheads would be established in the Strawberry Creek, Big Wash, Lexington Arch, Highland Ridge, and Mt. Washington areas. Campgrounds would also be designated in a number of rural subzone areas. All trailheads would have orientation exhibits, and all campgrounds would incorporate information shelters.

The Park Service would obtain rights-of-way from the Bureau of Land Management and the Forest Service for the Strawberry Creek, Big Wash, North and South Lexington Wash, and Mt. Washington approach roads. These roads would be gravel but would be upgraded to accommodate two-wheel-drive low clearance vehicles. Rights-of-way would extend 200 feet on each side of the road centerline. The roads would be upgraded and maintained by the Park Service.

Strawberry Creek. Seven rustic campsites would be designated along the Strawberry Creek access road. Each campsite would have perimeter definition as well as a picnic table, fire grate, and vault toilet. These campsites would not be fenced. A new rustic group campground and backcountry trailhead with 10-car gravel parking and a corral would be provided at the west end of Strawberry Creek. The campground would have six picnic tables, six fire grates, and two vault toilets. The trailhead would provide access for hikers and horseback riders to Upper Strawberry Creek, Windy Canyon, Blue Canyon, and the new Osceola tunnel interpretive trail. A separate 10-car parking area and trailhead would be constructed in the area to permit access to the southern portion of the Osceola ditch trail for hikers only. All of the trails in the Strawberry Creek vicinity would

Rural
Subzone

be in the semi-primitive subzone. Horseback riding in the area would be confined to Strawberry Creek, Windy Canyon, Blue Canyon, and the Osceola tunnel interpretive trail.

The 6-mile Strawberry Creek access road would be upgraded from dirt to two-wheel-drive gravel.

Big Wash. The 9-mile Big Wash access road would be upgraded for two-wheel-drive access. A 10-car gravel parking lot, corral, trailhead, and 5-site rustic campground would be developed on Forest Service land at the end of the road about a mile from the park boundary. A cooperative agreement would be established with the Forest Service for use of the site. The campsites would have perimeter definition and fire grates, and one vault toilet would be included.

Lexington Arch. Lexington Arch would be developed as a day use destination and would be included in the semi-primitive day use subzone. Access to the Lexington Arch trailhead and to the North Lexington Wash trailhead would be part of the rural subzone. The 11-mile dirt South Lexington Wash entry road would be upgraded to a two-wheel-drive gravel road, and a 10-car gravel parking area and trailhead for the arch would be developed 0.8 mile east of the park boundary. The North Lexington Wash access road would also be established as a two-wheel-drive gravel road with a 10-car gravel lot and trailhead at the park boundary.

Big Spring Wash and Highland Ridge. Access to these two areas would be on unmaintained roads administered by the Bureau of Land Management and Forest Service. The Park Service would provide informal parking, corrals, and trailhead orientation exhibits at the access points to areas inside the park boundary.

The road through Decathlon Canyon crosses the extreme southwestern boundary of the park. This portion of the unmaintained road would remain open to backcountry users traveling to Highland Ridge and to hunters wishing access to Forest Service lands farther up the canyon.

Mt. Washington. Alternative C is the only alternative that would provide for public vehicular access to Mt. Washington. The Park Service would obtain rights-of-way from the Forest Service and Bureau of Land Management for use of the existing gravel road from County Road 894 to a 25-acre site adjacent to Lincoln Canyon. This road would be maintained by the Park Service for two-wheel-drive low-clearance

vehicles. The 25-acre parcel, which is currently administered by the Forest Service, would be transferred to the Park Service.

A 3,000-square-foot visitor contact/interpretive facility, a 10- to 15-car gravel parking area, and a small NPS support complex would be built at the Lincoln Canyon site. It would be the only visitor contact facility on the west side of the park and would provide information about the park in general as well as interpretation of the bristlecone pine. Interpretive media would include museum exhibits, publications, and possibly audiovisuals. A small maintenance building and yard would be established near the contact facility. A duplex and a single-family residence would also be included, to be occupied on a seasonal basis by maintenance and ranger personnel. Power would be provided by an electric generator. A septic system would handle wastewater, and a well or treated springs would provide potable water.

A new 2.5-mile four-wheel-drive access road would be developed from the interpretive facility to a point intersecting the impassable trace road that connects the Pole Canyon mine with the Mt. Washington summit. A 2.5-mile portion of the trace road would be upgraded to provide four-wheel-drive access to an area just below the Mt. Washington summit. A 10- to 15-car gravel parking area and trailhead would be developed, and a small ranger cabin constructed, in the nearby limber pine forest. The area would be seasonally staffed and open for visitor use during the summer months. The trailhead would provide access to the Mt. Washington semi-primitive day use area.

The semi-primitive day use subzone would include the Wheeler Peak, Lexington Arch, and Mt. Washington day use areas, which would all have well-maintained hiking trails providing access to significant features. Trail maintenance, rehabilitation, reconstruction, and interpretation would be carried out in the Wheeler Peak and Lexington Arch areas, as described in the proposed action, and new interpretive trails would be established in the Wheeler Peak cirque area and on Mt. Washington. Information and interpretation would be provided in trailhead orientation exhibits and interpretive exhibits panels along the trails. Semi-primitive day use areas would receive relatively high use, and contacts would be moderate to frequent.

Semi-Primitive
Day Use
Subzone

Wheeler Peak Day Use Area. The Wheeler Peak day use area would encompass the system of hiking trails that lead to the alpine lakes, bristlecone pine forest, glacier, rock glacier, and Wheeler Peak. Of the existing 4.6 miles of trails,

ALTERNATIVE C - ACCESS EMPHASIS

0.9 mile would be maintained, 1.5 miles would be rehabilitated, and 2.2 miles would be reconstructed or relocated. One new trail would be constructed - the 0.1-mile barrier-free Wheeler Peak meadow loop trail described in the proposed action. This trail would be routed through spruce forest, meadow, and streamside areas, and exhibit panels would provide interpretation of natural resources along the trail route. Orientation exhibits would be established at all trailheads for the Wheeler Peak trail system, and new interpretive exhibit panels would be developed for the bristlecone and Teresa Lake trails. A self-guiding publication would provide interpretation of the features along and visible from the Wheeler Peak trail.

Lexington Arch Day Use Area. The 1.0-mile Lexington Arch hiking trail winds through a riparian area from the trailhead to Lexington Arch and beyond to link with the backcountry trail system. This trail would be upgraded to an unhardened medium-standard hiking trail to accommodate increasing levels of visitor use. New interpretive exhibit panels would be developed to interpret the arch.

Mt. Washington Day Use Area. A new 1.0-mile interpretive loop trail would be constructed through the bristlecone pine forest on the east side of Mt. Washington. This trail would lead from the Mt. Washington trailhead to the summit of Mt. Washington and then east down a ridgeline through an impressive stand of bristlecone pines. An orientation exhibit would be established at the trailhead, and new interpretive exhibit panels would be produced for the trail.

of the proposed trailhead and east of the confluence of the north and south forks of Big Wash crosses private land. The Park Service would seek to obtain a trail easement from the owner of this property.

Seven new trails totaling 23.4 miles would be constructed to link various features and drainages in the park - the Strawberry Creek/Wheeler Peak trail, the Osceola ditch nature trail, the Lehman Creek/Baker Creek trail, the Pole Canyon/Baker Creek trail, the North Fork of Big Wash/Snake Creek trail, the Big Spring Wash/Lexington Arch trail, and the South Fork of Big Wash/Decathlon Canyon trail. These trails and the terrain they would pass through are described in the proposed action.

Five or six backcountry campsites would be provided in the semi-primitive subzone: one at Johnson Lake, one at Baker Lake, one below Baker Lake with a corral for horse use, and two or three in as-yet-unspecified areas. These campsites would be have designated tent pads or some type of primitive shelter to concentrate use and reduce impacts. Wood fires would be prohibited in all alpine and subalpine areas. If the camping demand exceeded the number of campsites, the park would issue overnight camping permits for some of these areas to regulate use.

On-site interpretation in the semi-primitive subzone would be limited to low-profile directional, safety, and resource protection signs. Self-guiding publications would be developed to provide information about and interpretation of resources associated with backcountry trails. The publications would include route maps, safety information, and interpretation of cultural and natural features.

Semi-Primitive Subzone

This alternative would entail the largest acreage of semi-primitive subzone lands, including most of the Strawberry Creek/Osceola ditch vicinity, the lands south of Lehman Creek and west of Baker Creek, the area including the Baker Lake/Johnson Lake trail system, much of Kiou Basin, and large tracts in the central and southern parts of the park. Existing and proposed trails in this subzone would provide plentiful opportunities to discover the park's backcountry on foot or on horseback. Camping would be permitted, and a few backcountry campsites would be designated. Visitors would have relatively infrequent contacts with one another and would travel along the trails in relative seclusion.

A total of 53.9 miles of existing trails in the semi-primitive subzone would be maintained, rehabilitated, or reconstructed, as described in the proposed action. This would include 11.5 miles to be rehabilitated, and 42.4 miles to be reconstructed or relocated. The portion of the existing Big Wash trail west

Alternative C would designate the smallest amount of primitive subzone acreage, including areas in the west-central part of the park, south of Kiou Basin, and southeast of the Mt. Washington day use area. There would be no visitor facilities and no on-site interpretive media in this subzone. Orientation, information, and interpretation would be through maps and other carry-along published materials. People seeking the highest degree of challenge and physical commitment would be attracted to the primitive subzone. Contacts would be rare, and opportunities for solitude would be great.

Primitive Subzone

The special use zone would continue to contain the 30-foot-high television relay tower and associated concrete structure near Cedar Spur operated by the White Pine

Special Use Zone

Television District and the radio repeater on Bald Mountain operated by the Forest Service.

**Access for
the Disabled
and Elderly**

Barrier-free facilities would include the new orientation center in Baker, all pullouts along the eastern portion of Wheeler Peak Scenic Drive, the new visitor center in Kiou Basin, the paved trail from the Lehman Cave parking area to the interpretive center, the interpretive center itself, the paved trail and viewing platform at the mahogany shrub/Mt. Moriah overlook, the aspen/Lehman Creek pullout, the spruce-fire/Wheeler Peak cirque overlook, the proposed Wheeler Peak trailhead and parking area and the adjacent paved meadow loop trail, and two campsites at nearby Wheeler Peak campground.

**Concession
Services**

The Lehman Cave concession operation would remain in its present location in the Lehman Cave interpretive center and would continue to provide limited food service, souvenir sales, and book sales.

Commercial use licenses would continue to be issued for tour group operators. Additional commercial use licenses might be issued for vehicular towing and road service, supplying firewood to campgrounds, backcountry horse trips, or other activities to serve park visitors. These licenses would not be limited in number but would be issued on a case-by-case basis.

**NATURAL
RESOURCE
MANAGEMENT**

Natural resources would be managed as described in the proposed action, with the following differences.

Grazing Management – Areas above 10,500 feet in elevation would not be zoned as protected natural areas, and grazing would continue to be permitted.

Fish and Wildlife Management – The Park Service would actively seek to reestablish the Bonneville cutthroat trout in all streams on the east side of the park that are believed to have historically contained this species. This would involve the elimination of all nonnative fish in all east-side streams and lakes in the park. The Park Service would also continue to actively protect the existing Bonneville cutthroat trout populations in streams in the northwest section of the park.

Because of potential conflicts with cattle grazing on existing allotments within the park, the Park Service would not actively seek to establish an elk herd in the park. If it could be demonstrated that elk would not cause adverse competition for forage and that their presence would not contribute to erosion or poor range conditions, elk would be allowed to move into the park on their own.

Under alternative C cultural resource management actions would be the same as in the proposed action.

**CULTURAL
RESOURCE
MANAGEMENT**

Land protection actions for the Spring Valley and Snake Valley basins, the regional exhibit shelters, the rights-of-way, cooperative agreements, and easements, and the patented lands adjacent to the southwestern park boundary would be the same as in the proposed action; rights-of-way mileages are shown in table 20 in the impacts of alternative C section. In addition, the following actions would be taken in the Kiou Basin and Mt. Washington/Lincoln Canyon areas.

**LAND
PROTECTION**

The proposed trail connecting Pole Canyon with Kiou Basin would cross Forest Service land. The Park Service would establish a cooperative agreement with the Forest Service for NPS management and maintenance of this portion of the trail corridor.

**Kiou Basin
Trail
Connection**

Alternative C proposes to develop a visitor contact/interpretive facility, parking, and a small NPS support complex (maintenance and housing) on a 25-acre site near Lincoln Canyon along the lower southwest side of Mt. Washington. This site is currently administered by the Forest Service. Negotiations would be pursued with the Forest Service, Bureau of Land Management, and the General Services Administration to include the site in the park boundary to be administered by the Park Service as a detached unit of Great Basin National Park.

**Lincoln Canyon/
Mt. Washington
Contact Facility**

ALTERNATIVES CONSIDERED BUT REJECTED

No other planning alternatives were identified during the scoping process for Great Basin. However, several options for management and use within the park were considered but rejected.

SNOWMOBILING, MOUNTAIN BIKING, AND HANG GLIDING Great Basin contains a number of exceptional resources, and it provides important opportunities for solitude and contemplative experiences. The plan focuses on perpetuating these experiences to encourage a greater understanding and appreciation of the park and the Great Basin region. Snowmobiling would cause noise, pollution, and wildlife disturbance along tracks and in the backcountry. Mountain biking would greatly increase erosion and could result in wildlife disturbance and conflicts with hikers and horseback riders along trails. Hang gliding, which has become a popular spectator sport, would likely generate crowds and related crowd control problems. For these reasons and because the large amount of public land surrounding the park (more than 85 percent of the lands in the region) provides suitable terrain and ample opportunities for more active recreational uses, it is proposed that only low-impact activities be permitted in the park and that snowmobiling, mountain biking, and hang gliding be prohibited.

DOGS IN THE BACKCOUNTRY To preserve the solitude associated with backcountry experiences and to reduce the potential for conflicts between dogs and wildlife (as well as visitors and horses), dogs would not be permitted in the semi-primitive day use, semi-primitive, primitive, protected natural area, and research natural area subzones. Dogs would be allowed on leashes in the modern and rural subzones.

AERIAL TRAM OR HIGH-STANDARD ROAD ACCESS TO THE MT. WASHINGTON SUMMIT All actions that would result in excessively large numbers of visitors having access to the fragile and unique bristlecone pine forest on Mt. Washington were rejected. Both an aerial tram and a high-standard road would be extremely detrimental to the bristlecone pines and would intrude on the pristine visual qualities associated with this rugged western escarpment. Construction of such a road on the escarpment would also cause excessive damage to the physical and biological resources in the area.

COMPLETE ELIMINATION OF GRAZING Because section 3(e) of the park's enabling legislation authorized grazing on lands within the park, this activity was not identified as an issue in the Great Basin Alternatives Workbook. However, more than 200 write-in responses to

the workbook (out of a total of 1,200) suggested that grazing was incompatible with the purpose of the park and should be eliminated. Although the option of eliminating grazing was not considered during planning, recommendations are included in the "Natural Resource Management" sections of the proposed action and alternatives for closely regulating grazing and reallocating or permanently withdrawing any allotments that are vacated in the future.

Because of the park's predominately steep terrain, existing campgrounds are located on gentler slopes adjacent to or along stream corridors. A substantial number of former Forest Service campgrounds and campsites exist in these riparian areas, particularly on the east side of the park where visitor use has traditionally been concentrated. To prevent further impacts to these areas (riparian areas are designated in the plan as having exceptional resource value) and to avoid the negative impacts associated with building campsites in the floodplain or on hillsides and steep slopes, it was determined that a ceiling of 265 campsites and two group campgrounds should be established as the park's acceptable upper limit. Options to go beyond a 265 campsite total within the park were rejected.

**INCREASED
CAMPSITE
CAPACITY**

The proposed action and alternatives recommend the following increases in campsites over existing conditions (119 sites): proposed action - 35 percent (161 campsites plus two group campgrounds), alternative A - 38 percent (165 campsites plus one group campground), alternative B - 44 percent (172 campsites plus one group campground), and alternative C - 123 percent (265 campsites plus two group campgrounds). Most of the increases would be in the proposed Lehman Flats campground, which would be located in one of the few areas in the northern part of the park that is flat and outside the floodplain. The 123 percent increase under alternative C - 125 sites at the Lehman Flats campground and modest increases in the number of campsites at Snake Creek, Big Wash, and Highland Ridge - represents the upper limits for the Lehman Flats site and the other campgrounds in the floodplain. If this 265-campsite capacity proved inadequate to meet demand, the Park Service would encourage private enterprise to develop campgrounds outside the park to serve the visiting public.

**LEHMAN
CAVE
TOUR
CAPACITY**

A cave tour capacity of 600 people per day (20 tours of 30 people each) was established as part of this planning effort, and no options were considered that would exceed that capacity. Cave tour capacity is based on studies and observations by the park staff over several years, which indicated that numbers above 600 people per day have negative effects on resources and visitor experiences.

The option of initiating self-guiding tours in Lehman Cave was also rejected. Managers of many cave parks, especially those with large caverns, have adopted self-guiding systems in response to rapid increases in visitation. However, because of the small size of Lehman Cave and the large number of delicate features within easy reach of visitors, this option is not feasible.

TABLE 2: SUMMARY OF PROPOSED ACTION AND ALTERNATIVES

Topic	Proposed Action	Alternative A	Alternative B	Alternative C
MANAGEMENT ZONING	Zone the park to provide a balanced range of recreational opportunities; zone the Wheeler Peak Scenic Drive corridor, Kious Basin, Baker Ridge, Lehman Cave, the Wheeler Peak day use area, and the Baker Creek and Lexington Arch areas for relatively high levels of visitor use (modern and semi-primitive day use); designate rural subzones on Strawberry and Snake creeks and along the access roads to Big Wash and Lexington Arch; place the largest amount of land, including all backcountry trail corridors, in the semi-primitive subzone; designate fragile alpine areas and the Mt. Washington bristlecone pine forest as protected or research natural areas; include the remainder of the park in the primitive subzone.	Zone the park to reflect existing uses; designate modern and semi-primitive day use subzones in the Lehman Cave and Wheeler Peak areas, small rural subzones in Strawberry Creek, Baker Creek, Kious Basin, and Snake Creek, and semi-primitive subzones in the northern and central parts of the park; place the remainder of the park in the primitive subzone.	Zone the park to focus on primitive and backcountry uses; limit the modern and semi-primitive day use subzones to the Lehman Cave and Wheeler Peak areas; place Strawberry Creek, Baker Creek, and the Snake Creek and Lexington Arch access roads in the rural subzone; designate semi-primitive areas in the northern and central parts of the park; provide protection for alpine areas and the Mt. Washington bristlecone pine forest by including them in the protected or research natural area subzones; zone the largest portion of the park, including most of the lands below Snake Creek, as primitive.	Zone the park to make more areas accessible by car or 4WD vehicle; include the Snake Creek area in the modern subzone along with the Wheeler Peak Scenic Drive corridor, Kious Basin, Baker Ridge, Baker Creek, and Lehman Cave; zone three areas for semi-primitive day use, including the Wheeler Peak day use area, the Mt. Washington area, and Lexington Arch; place Strawberry Creek and the access roads at Big Wash, Lexington Arch, and Mt. Washington in the rural subzone; zone extensive areas of the park, including the expanded trail system, as semi-primitive; designate a few remote and isolated areas as part of the primitive subzone.
VISITOR USE AND DEVELOPMENT				
Access				
• Wheeler Peak Road/Scenic Drive	Develop Wheeler Peak Scenic Drive by rehabilitating 12 miles of the existing Wheeler Peak road and constructing a new 9-mile eastern extension (park entrance road); construct a trailer drop-off at Lehman Flats; restrict access on the existing entrance road (Nevada 488) at the park boundary.	Maintain Nevada 488 as the main park entrance road; rehabilitate the Wheeler Peak road; construct a trailer drop-off at Lehman Flats.	Same as alternative A.	Same as the proposed action except that the new park entrance road would be aligned to pass through Kious Basin.
• Baker Creek Road	Pave the existing Baker Creek road and connect to the new Wheeler Peak Scenic Drive.	Maintain the Baker Creek road as a gravel road (2WD accessible).	Same as alternative A.	Same as the proposed action.
• Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch Roads	Upgrade the Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch roads from dirt to gravel (2WD accessible).	Grade the Strawberry Creek, Snake Creek, and Lexington Arch roads to make them accessible to 4WD and 2WD high-clearance vehicles; take no action on the Big Wash road.	Same as the proposed action except that no action would be taken on the Big Wash road.	Same as the proposed action except that the Snake Creek road would be paved.
• Big Spring Wash and Highland Ridge Access Roads	No action (4WD access to park boundary on BLM and USFS roads as at present).	Same as the proposed action.	Same as the proposed action.	Same as the proposed action.

Topic	Proposed Action	Alternative A	Alternative B	Alternative C
• Mt. Washington Access Road	No action (4WD access to park boundary on BLM and USFS roads as at present); gate road at park boundary.	Same as the proposed action	Same as the proposed action	Upgrade the access road from County Road 894 to the Lincoln Canyon development site from dirt to gravel (2WD accessible); upgrade the road from the Lincoln Canyon site to the base of Mt. Washington for 4WD access.
Major Visitor Facilities				
• Great Basin Visitor Center	Construct a new Great Basin visitor center on Baker Ridge with direct access from Wheeler Peak Scenic Drive; include a 50-vehicle paved parking area, picnic area, barrier-free pathway, entry court, lobby, auditorium, exhibit space, large viewing deck, and restrooms.	No action	Construct a new Great Basin visitor center/administration building on an 80-acre site near Baker, with 75-vehicle parking.	Construct a new Great Basin visitor center in Kiouas Basin, with 50-vehicle parking.
• Lehman Cave Visitor Center/Interpretive Center	Convert the existing Lehman Cave visitor center to an interpretive center focusing on the cave story; construct a new 100-vehicle paved parking area, cave ticket sales kiosk/shelter, picnic area, and wheelchair-accessible trail to the interpretive center; retain the existing upper parking lot for visitors with disabilities and for service and emergency vehicles only; remove the lower parking lot.	Rehabilitate the existing Lehman Cave visitor center to accommodate both the Great Basin and cave story presentations; construct a new 50-vehicle overflow parking area, picnic area, and wheelchair-accessible trail to the visitor center; retain the existing upper and lower parking lots in front of the building.	Remove the Lehman Cave visitor center; construct a new 100-vehicle parking area, cave ticket sales kiosk/shelter, picnic area, and wheelchair-accessible trail to the cave entrance; remove the existing upper and lower parking lots.	Same as proposed action
• Orientation/Information Center	Construct an orientation center on an 80-acre site near Baker, with 30-vehicle parking.	Continue to provide orientation and information at the Lehman Caves visitor center.	Provide orientation and information at the new Great Basin visitor center on an 80-acre site near Baker.	Same as proposed action
• Mt. Washington Visitor Contact Station	No action	No action	No action	Construct a visitor contact station at the base of Mt. Washington (Lincoln Canyon) on west side of the park, with 15-car gravel parking.
Other Developments				
• Regional Exhibit Shelters	Construct four regional exhibit shelters along the major highways leading to the park to interpret both the Great Basin physiographic region and the park.	No action	Same as proposed action	Same as proposed action
• Interpretive Pullouts	Develop 11 interpretive pullouts along the length of Wheeler Peak Scenic Drive to interpret both the basin and range environments; establish short interpretive trails at two of the pullouts; provide paved parking for 15 to 20 cars at the park entrance pullout, parking for 5 to 10 cars at the remaining pullouts.	Provide five interpretive pullouts along the park entrance and Wheeler Peak roads with 5- to 10-car parking.	Provide six interpretive pullouts along the park entrance and Wheeler Peak roads with 5- to 10-car parking.	Same as the proposed action

Topic	Proposed Action	Alternative A	Alternative B	Alternative C
• Trailheads and Trails				
Wheeler Peak Pullout/Trailhead	Establish a major trailhead for the Wheeler Peak day use area, with a new 50-vehicle paved parking area, interpretive/orientation displays, seating, and restrooms; incorporate the final Wheeler Peak Scenic Drive interpretive pullout into the trailhead development.	Same as the proposed action except 25-vehicle parking would be provided.	Same as the proposed action except 40-vehicle parking would be provided.	Same as the proposed action.
Other Trailheads	Establish or formalize trailheads with parking at Kiowas Basin, Baker Ridge, Baker Creek (two), Upper Lehman Creek, summit, Strawberry Creek (two), Snake Creek (two), Big Wash, Lexington Arch, Big Spring Wash, and Highland Ridge; include corrals at Baker Creek (two), Strawberry Creek, Snake Creek, Big Wash, Big Spring Wash, and Highland Ridge.	Establish or formalize trailheads with parking at Baker Creek, Upper Lehman Creek, summit, Strawberry Creek (two), Snake Creek (two), and Lexington Arch; provide no corrals.	Establish or formalize trailheads with parking at Baker Creek (two), Upper Lehman Creek, summit, Strawberry Creek (two), Snake Creek, and Lexington Arch; include corrals at Baker Creek and Strawberry Creek.	Same as the proposed action except that no trailhead would be established at Baker Ridge and only one corral would be provided at Baker Creek; in addition, a trailhead would be established at Mt. Washington.
Trails	Rehabilitate or reconstruct 60 miles of existing trails and construct 24 miles of new trails to interpret significant features and life zones and to provide access to and through the park's backcountry north to south; designate 64 miles of trails for hikers and horseback riders, 20 miles for hikers only; total trail miles - 84.	Rehabilitate or reconstruct 36 miles of existing trails and construct 1 mile of new trail; designate 31 miles for horse/hiker use, 6 miles for hikers only; total trail miles - 37.	Rehabilitate or reconstruct 36 miles of existing trails and construct 10 miles of new trails; designate 30 miles for horse/hiker use, 18 miles for hikers only; total trail miles - 48.	Same as the proposed action, except that 1 additional mile of trail would be built in the Mt. Washington area; total trail miles - 85.
• Campgrounds				
Grey Cliffs	Eliminate three loops and convert the fourth for group camping; include a new paved access road, six paved pull-in sites, a campfire circle, and vault toilets.	Same as the proposed action except that there would be no paving.	Same as alternative A.	Same as the proposed action.
Baker Creek	Retain 32 limited-service sites (tent, small RV, and trailer camping; one site for disabled visitors) with gravel roads and pull-ins; include a campfire circle and new vault toilets.	Same as proposed action.	Same as the proposed action.	Same as the proposed action except that the roads and pull-ins would be paved.
Upper Lehman Creek	Retain 24 limited-service sites (tent, small RV, and small trailer camping; one site for disabled visitors); provide a campfire circle and new vault toilets.	Same as the proposed action.	Same as the proposed action.	Same as the proposed action.
Lower Lehman Creek	Eliminate the campground and revegetate the site.	Same as the proposed action.	Same as the proposed action.	Same as the proposed action.
Lehman Flats	Construct and pave 50 new limited-service campsites and an access road (two sites for disabled visitors); include an amphitheater, water system, dump station, and low-volume flush toilets.	Same as the proposed action.	Same as the proposed action except 100 sites would be constructed.	Same as the proposed action except 125 sites would be constructed.

Topic	Proposed Action	Alternative A	Alternative B	Alternative C
Wheeler Peak	Retain 37 limited-service sites (tent camping and small RVs only; two sites for disabled visitors); include a campfire circle and new vault toilets.	Same as the proposed action	Eliminate the campground.	Same as the proposed action
Strawberry Creek	Designate 7 rustic campsites along the creek; establish 1 rustic group campground with vault toilets.	Designate 5 rustic campsites along the creek.	Establish a 15-site rustic cluster campground with vault toilets.	Same as the proposed action
Snake Creek	Designate 10 rustic campsites along the creek; establish 6 rustic cluster campsites at the west end.	Same as the proposed action	Eliminate all campsites along the creek and revegetate.	Establish 3 new paved limited-service campgrounds (10 sites each).
Backcountry campsites	Establish 5 to 6 backcountry campsites (one with a corral).	Establish no backcountry campsites	Same as the proposed action except that the locations might be different	Same as alternative B
• Administrative Facilities	Construct an administration building, maintenance compound, and residential area on an 80-acre site near Baker; relocate all maintenance and most administration and staff housing to this site; remove existing maintenance buildings and housing units (except those necessary for protection) in the Lehman Cave area and revegetate the sites.	Construct a new administration building next to the Lehman Cave overflow parking area and relocate most functions there; retain and expand the existing maintenance and housing areas.	Construct a visitor center/administration building, maintenance compound, and residential area on an 80-site near Baker and relocate all functions there; remove the existing visitor center and maintenance and housing structures in the park and revegetate the sites.	Same as alternative A except that all maintenance functions would be relocated to a new maintenance complex on the existing -twage lagoon site
Concession	Retain the food and souvenir concession at the Lehman Caves interpretive center.	Same as the proposed action	Remove the concession operation from the park.	Same as the proposed action

NATURAL RESOURCE MANAGEMENT

Man-Caused Influences

• Domestic Livestock Grazing	Continue to allow domestic livestock grazing in accordance with the enabling legislation, except in the semi-primitive day use, protected natural area, and research natural area subzones (alpine areas above 10,500 feet, the Wheeler Peak and Mt. Washington areas, and Pine and Ridge creeks); institute management methods to separate visitors and livestock and to protect sensitive species.	Same as proposed action except grazing would continue above 10,500 feet, in the Pine and Ridge creek drainages, and around Mt. Washington (there would be no protected or research natural area subzones)	Same as proposed action except that grazing would also be prohibited in all areas with sensitive plant species	Same as proposed action except grazing would continue above 10,500 feet (there would be no protected natural area subzone)
• Mining Claims within the Park	Continue to examine the validity of all existing claims; review mining plans of operations based on the Mining in the Parks Act and promulgating regulations (36 CFR 9A).	Same as the proposed action	Same as the proposed action	Same as the proposed action
Fish and Wildlife				
• Bonneville Cutthroat Trout	Reestablish Bonneville cutthroat trout into selected streams on east side of park; protect existing populations on the west side of the park.	Protect existing Bonneville cutthroat populations, but do not reestablish them in streams on east side of park.	Reestablish Bonneville cutthroat in all streams on east side of park that historically contained them.	Same as alternative B
• Fish Stocking	Do not permit fish stocking in the park.	Same as the proposed action	Same as the proposed action	Same as the proposed action

Topic	Proposed Action	Alternative A	Alternative B	Alternative C
• Rocky Mountain Bighorn Sheep	Make no attempt to reestablish Rocky Mountain bighorn sheep.	Same as the proposed action	Same as the proposed action	Same as the proposed action
• Elk	Protect elk and allow them to establish a viable herd.	Same as the proposed action	If it is proved that elk were once resident on lands within the park, actively work to reintroduce this species.	Same as the proposed action
• Mule deer	Allow deer populations to fluctuate naturally within the park.	Same as the proposed action	Same as the proposed action	Same as the proposed action
• Native predators	Protect predators and ensure that predator populations are maintained at natural levels within the park.	Same as the proposed action	Same as the proposed action	Same as the proposed action
• Threatened, Endangered, and Sensitive Species	Take an active part in reestablishing and protecting habitat for all threatened, endangered, and sensitive species.	Same as the proposed action	Same as the proposed action	Same as the proposed action
CULTURAL RESOURCE MANAGEMENT				
National Register Sites				
• Lehman Orchard	Preserve the orchard and interpret it from the vicinity of the Lehman Cave interpretive center.	Same as the proposed action	Same as the proposed action	Same as the proposed action
• Lehman Aqueduct	Preserve existing remains and provide additional interpretation at the Lehman Cave interpretive center.	Same as the proposed action	Same as the proposed action	Same as the proposed action
• Rhodes Cabin	Preserve and adaptively use the cabin to house new exhibits concerning Rhodes and the cabin's original purpose.	Same as the proposed action	Same as the proposed action	Same as the proposed action
Sites Recommended for Nomination				
• Osceola Ditch (adjacent to Wheeler Peak Scenic Drive)	Reconstruct and rewater a portion of the wooden flume and ditch excavation and interpret it as an outstanding cultural feature.	Same as the proposed action except that there would be no restoration or rewatering of the ditch and flume	Same as the proposed action	Same as the proposed action
• Osceola Ditch Tunnel (Strawberry Creek)	Preserve, stabilize, and interpret the tunnel.	Same as the proposed action	Same as the proposed action	Same as the proposed action
Non-Register Sites				
	Leave to deteriorate naturally (no preservation or stabilization); interpret selected sites.	Same as the proposed action	Same as the proposed action	Same as the proposed action
Archeological Sites				
	Prepare a comprehensive parkwide inventory, survey areas to be affected by development and obtain archeological clearance before construction.	Same as the proposed action	Same as the proposed action	Same as the proposed action
LAND PROTECTION				
Spring Valley and Snake Valley Viewsheds	Review, evaluate, and make recommendations to local governments concerning all major proposed developments or activities that might affect the visual integrity of the two valleys.	No action	Same as the proposed action	Same as the proposed action

Topic	Proposed Action	Alternative A	Alternative B	Alternative C
Mt. Washington Addition	No action	No action	Add 1,350 acres to the park along the western boundary adjacent to Mt. Washington.	No action
Baker Ridge Addition	Add 1,280 acres along the eastern park boundary adjacent to the proposed Great Basin visitor center on Baker Ridge.	No action	No action	No action
Rights-of-Way, Cooperative Agreements, and Easements	Obtain rights-of-way from the BLM and Forest Service for access to the park along the new park entrance road and the Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch approach roads; establish cooperative agreements with the Forest Service for development and use of the parking area/trailheads at Big Wash and Lexington Arch; seek an easement for the portion of the Big Wash trail that crosses private land.	Establish cooperative agreements with the BLM and Forest Service to maintain and use the Strawberry Creek, Snake Creek, and Lexington Arch trailhead approach roads.	Obtain rights-of-way from the BLM and Forest Service for access to the park along the Strawberry Creek, Snake Creek, and Lexington Arch approach roads; establish a cooperative agreement with the Forest Service for the Lexington Arch trailhead.	Same as the proposed action except that two rights-of-way would be obtained for Lexington Arch; in addition, a cooperative agreement would be established with the Forest Service for the Pole Canyon/Kious Basin trail connection, and the Park Service would seek transfer of a 25-acre Forest Service site below Mt. Washington for development as a visitor contact station.
Patented Mining Claims adjacent to the Park Boundary	Submit a recommendation to Congress for a boundary addition to acquire the patented claims on the west side of the park near Mt. Washington on a willing-seller basis to ensure preservation of the nationally significant bristlecone pine resource.	Same as the proposed action	No action (add the approximately 1,850 acres to the park that contain the patented claims)	Same as the proposed action

TABLE 3: SUMMARY OF ALTERNATIVE ZONING ACREAGES

Zone/Subzone	Proposed Action	Alternative A	Alternative B	Alternative C
Park Development	1,148	939	939	2,000
Modern	1,148	939	939	2,000
Natural	77,204	76,983	77,983	75,072
Rural	2,341	4,178	1,850	1,395
Semi-Primitive Day Use	1,574	1,574	1,441	3,847
Semi-Primitive	28,486	12,356	17,344	47,650
Primitive	33,196	58,025	45,741	22,180
Protected Natural Area	9,334	0	9,334	0
Research Natural Area	2,273	0	2,273	0
Special Use	10	10	10	10
Totals	78,362	77,082	78,932	77,082

TABLE 4: SUMMARY OF ALTERNATIVE TRAIL MILEAGES AND TYPES

	Trail Mileages for Each Alternative			
	Proposed Action	Alternative A	Alternative B	Alternative C
Existing trails that would be maintained or upgraded and maintained	60	36	38	60
New trails that would be constructed	24	1	10	25
Total trail mileage	84	37	48	85
	Trail Types for Each Alternative			
	Proposed Action	Alternative A	Alternative B	Alternative C
Horse/Hiker	64	31	30	64
Hiker Only	20	6	18	21

TABLE 5: SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Impact Topic	Proposed Action	Alternative A	Alternative B	Alternative C
BIOLOGICAL AND PHYSICAL RESOURCES				
Bristlecone Pine Forests	The proposed action would provide increased protection to all bristlecone stands in the park. Vehicular access to the Mt. Washington stands would be eliminated; trails in the Wheeler Peak stand would be improved; all other known stands would be in the protected natural area subzone.	Alternative A would provide increased protection to the Mt. Washington and Wheeler Peak stands. Vehicular access to the Mt. Washington stands would be eliminated; trails in the Wheeler Peak stand would be improved. Other stands would not be zoned as protected natural areas.	Same as the proposed action	Alternative C would provide increased visitor access to the Mt. Washington stand, which could cause additional impacts. Trails in the Wheeler Peak stand would be improved; other stands would not be zoned as protected natural area zones.
Riparian Areas and Water Quality	Domestic livestock grazing would continue to adversely affect riparian areas and water quality, but to a lesser degree than at present. Development would be removed from approximately 2 acres of riparian habitat. The construction of new bridges would eliminate approximately 1/4 acre of riparian habitat.	Domestic livestock grazing would continue to adversely affect riparian areas and water quality. Development would be removed from approximately 2 acres of riparian habitat. No additional developments would be placed in riparian areas.	Domestic livestock grazing would continue to adversely affect riparian areas and water quality, but to a lesser degree than at present. Development would be removed from approximately 2 acres of riparian habitat. No additional developments would be placed in riparian areas.	Same as the proposed action
Alpine/Subalpine Areas	Alpine/subalpine areas would receive increased protection. New development would be limited to trails, and domestic livestock grazing would be prohibited in areas above 10,500 feet in elevation.	No development would be placed in alpine/subalpine areas. Domestic livestock grazing would continue.	Same as the proposed action	Improved access and new development in subalpine areas around Mt. Washington would attract more visitors to the sensitive meadows and high elevation vegetation communities, which could cause additional impacts.
Rare and Sensitive Plant Species	Proposed actions would provide increased protection to rare and sensitive plant species by prohibiting grazing above 10,500 feet and limiting the impacts from mining and recreational use.	Grazing would continue above 10,500 feet and would likely have an adverse effect on high elevation sensitive species. Increased protection would be provided by limiting the impacts from mining and recreational use.	Same as the proposed action	Grazing would continue above 10,500 feet and would likely have an adverse effect on high elevation sensitive species. Increased protection would be provided by limiting the impacts from mining. A greater number of visitors would be attracted to habitat occupied by rare and sensitive species around Mt. Washington, which could cause additional impacts.
Peregrine Falcons	The Park Service would actively seek to reestablish peregrine falcons and would provide additional protection for their habitat. There would be no developments near peregrine habitat on the west side of the park.	Same as the proposed action	Same as the proposed action	Peregrine falcon habitat would be adversely affected by proposed developments and uses on the west side of the South Snake Range.

Impact Topic	Proposed Action	Alternative A	Alternative B	Alternative C
Bonneville Cutthroat Trout	Habitat for the existing Bonneville cutthroat trout population would be further protected by zoning it as protected natural area and eliminating grazing within the subzone. Trout populations would be reintroduced into east-side streams, expanding their range.	There would be no additional protection for the existing Bonneville cutthroat population and no reintroductions of populations in the historic range on east side of the park.	Same as the proposed action, except that trout reintroductions into east-side streams would be more extensive.	Little additional protection would be provided to the existing Bonneville cutthroat population; grazing would continue to be permitted in trout habitat and would be controlled through management techniques. Trout populations would be reintroduced into all east-side streams, expanding their range.
Biological Diversity	There would be few direct effects on biological diversity. The fire management plan might contain provisions to allow natural fires to burn, which would help assure a diversity in habitats.	Same as the proposed action	Same as the proposed action	Same as the proposed action
Caves	The total number of developments on areas with the potential for underlying caves would decrease. More developments would be removed from these areas than would be constructed on them.	More developments would be built on areas with the potential for underlying caves, which would increase direct effects and possible future effects.	The total number of developments on areas with the potential for underlying caves would decrease. Some developments would be removed from these areas, and no new developments would be constructed on them.	The total number of developments on areas with the potential for underlying caves would increase. More developments would be built on these areas than would be removed from them.
Air Quality	Impacts on air quality would be minor.	Same as the proposed action	Same as the proposed action	Same as the proposed action
Vistas	Most NPS operational developments would be removed from the park, improving vistas in and of those areas.	No NPS developments would be removed from the park. Existing developments would continue to intrude on vistas.	All NPS operational developments would be removed from the park, improving vistas in and of those areas.	Most existing developments would remain in the park, and new developments would be constructed, resulting in additional impacts on vistas.
Floodplains and Wetlands	Two campgrounds would be removed from apparent floodplains (floodplains have not yet been mapped). New road alignments would require construction of two bridge crossings over apparent creek floodplains and associated riparian wetlands. Design of the bridge crossings would minimize the effects on these areas.	Two campgrounds would be removed from apparent floodplains. No additional developments would be constructed in floodplains or wetlands.	Same as alternative A	Same as the proposed action
Soils	About 124 acres of soils would be disturbed (36% BLM, 7% USFS, 57% NPS); 27 acres would be rehabilitated and revegetated. Grazing management actions would reduce the potential for soil erosion in areas above 10,500 feet and in riparian areas.	About 24 acres of soils would be disturbed (1% USFS, 99% NPS); 7 acres would be rehabilitated and revegetated. There would be little change in the potential for soil erosion.	About 73 acres of soils would be disturbed (23% BLM, 7% USFS, 70% NPS); 36 acres would be rehabilitated and revegetated. The impacts of grazing management actions would be the same as for the proposed action.	About 183 acres of soils would be disturbed (30% BLM, 9% USFS, 61% NPS); 21 acres would be rehabilitated and revegetated. There would be little change in the potential for soil erosion.
CULTURAL RESOURCES	Proposed actions would generally upgrade the preservation, protection, and interpretation of historic and archeological resources in the park.	Same as the proposed action	Same as the proposed action	Same as the proposed action

Impact Topic	Proposed Action	Alternative A	Alternative B	Alternative C
HUMAN ENVIRONMENT				
Livestock Grazing Permittees	Permittees would be required to restrict grazing livestock to certain locations but would be assured the continued availability of grazing allotments in the park.	There would be no impacts on grazing permittees.	Same as the proposed action	Same as the proposed action
Mineral Interests	Miners would face increased regulation. Economic impacts would be minimal.	Same as the proposed action	Same as the proposed action	Same as the proposed action
Residents and Private Property Owners	There would be a substantial reduction in traffic volumes and noise along the existing entrance road and an increase in traffic and noise south of Baker near the new scenic drive. Landowners adjacent to the park might be prevented from constructing certain types and levels of developments if those developments would affect the park's exceptional resources.	Traffic on the existing entrance road would increase as park visitation increased. Landowners adjacent to the park might be prevented from constructing certain types and levels of developments if those developments would affect the park's exceptional resources.	Same as alternative A	Same as the proposed action
Regional Economy	Actions would have a positive impact on the regional economy, but the actual economic benefit would be small.	Same as the proposed action except that the economic benefit would be smaller.	Same as alternative A	Same as the proposed action, except that the economic benefit would be somewhat larger.
Local Visitors	Opportunities for many traditional recreational uses would continue to be provided. Some consumptive and other recreational activities (for example, hunting, tree cutting, unrestricted four-wheel driving, undesignated camping, trapping, commercial harvesting, prospecting, and collecting) would be prohibited or more closely regulated than in the past.	Same as the proposed action	Same as the proposed action except that the upper reaches of Snake Creek would be closed to vehicular use.	Same as the proposed action, except that Snake Creek would become a major developed area and the Snake Creek road would be paved, which would change the traditional experience in that drainage.
Other Visitors	Visitor understanding and appreciation of the park would increase and a greater diversity of recreational opportunities would be provided.	Only limited new services, access, and interpretive programs would be provided for visitors.	Opportunities to explore the park's backcountry would be expanded. Few additional frontcountry services would be provided.	Same as the proposed action, except that more areas would be accessible by car and more frontcountry services would be provided.
MANAGEMENT				
Park Management and Operations	Substantial increases in law enforcement, resource management, and maintenance staffing and funding and slight increases in interpretive personnel and funding would be required.	Moderate increases in law enforcement and resource management staffing and funding and slight increases in maintenance and interpretation staffing and funding would be required.	Substantial increases in maintenance staffing and funding, moderate increases in law enforcement and resource management, and slight increases in interpretation would be required.	Substantial increases in law enforcement, resource management, maintenance, and interpretive staffing and funding would be required.
U.S. Forest Service and Bureau of Land Management	There would be few impacts on these agencies.	Same as the proposed action	Same as the proposed action	Same as the proposed action



AFFECTED ENVIRONMENT

REGIONAL CONTEXT AND SOCIOECONOMIC PROFILE

Great Basin National Park is in the southern portion of the Snake Range in east-central Nevada. The park lies entirely within White Pine County, Nevada, just west of the towns of Baker, Nevada, and Garrison, Utah. It is centrally located in a four-county region that includes White Pine and Lincoln counties in Nevada and Millard and Beaver counties in Utah. The Utah border is only 12 miles east of the park boundary. The two largest towns within a relatively short distance of the park are Ely, Nevada, about 65 miles northwest, and Delta, Utah, about 90 miles east. Other major population centers within a six-hour drive of the park include Salt Lake City, Utah, 250 miles northeast, and Las Vegas, Nevada, 300 miles south-southwest.

ACCESS AND TRANSPORTATION

The entrance to Great Basin National Park is about 5 miles south of US 6/50 on Nevada Highway 487 in the town of Baker. Although the park is in a relatively isolated part of the region, it is served by a well-maintained road system and is easily accessible by automobile. US 6/50 is the major east-west thoroughfare through the region. It departs from US 70 in Utah, heads west through Delta, and passes through the Snake Range just north of the park. US 6/50 splits in Ely; US 50 heads due west across the state, and US 6 goes southwest to Tonopah, Nevada. US 93 is a major north-south route through the region that runs north from Las Vegas, passes through Spring Valley and Ely west of the park, and continues north to Twin Falls, Idaho. Highway 487 runs south from US 6/50 through the Snake Valley, which borders the park on the east. It passes through Baker and ends at Garrison, where it is redesignated as Utah Route 21.

Nevada Highway 488 is the primary entrance road for the park and also serves several private residences and businesses just outside the park boundary. Numerous improved and unimproved dirt roads and four-wheel-drive trails lead from the main arteries that surround the park across Snake and Spring valleys, providing access to Humboldt National Forest, a number of privately owned lands, inactive mines, and the small communities of Shoshone and Minerva. Most of these routes are closed at the park boundary; exceptions are the Snake Creek, Strawberry Creek, Baker Creek, and Lexington Creek access roads.

Commercial and charter airlines serve Yelland Field in Ely, where car rentals are available. Sierra Nevada Stage Lines has bus service to Ely. There is no commercial rail transportation into the region at present.

The four-county region surrounding the park (Lincoln, White Pine, Millard, and Beaver) totals 28,941 square miles. To date, no comprehensive land use map exists for this region. However, a telephone survey of land-managing agencies in Nevada and Utah enabled the planning team to determine land use and landownership for 97.7 percent of the lands within the region. The survey indicated that 92.1 percent of the lands are federally owned and managed, and the majority are under the jurisdiction of the Bureau of Land Management. The remaining 5.6 percent of the lands are privately owned and include residential and commercial property, agricultural land, and patented mines. Table 6 summarizes land use and landownership for the four county region. The major land uses on both public and private lands are agriculture, ranching, grazing, hunting, fishing, forestry, recreation and tourism, mining, and oil and gas development.

LANDOWNERSHIP AND USE

Table 6: Landownership in White Pine, Lincoln, Millard, and Beaver Counties

Federal Lands	92.1%
National Park Service	0.4%
Bureau of Land Management	78.0%
U.S. Forest Service	7.1%
U.S. Fish and Wildlife Service	4.2%
State and Local Government	1.0%
Department of Defense/Army Corps of Engineers	1.0%
Tribal Lands	0.4%
Privately Owned Lands	5.6%
Agriculture, residential, commercial, patented mines	
Other - information unavailable	2.3%

Agriculture, Ranching, and Grazing Small ranches and farms occur throughout the region, with Millard County leading in alfalfa, barley, wheat, corn, and potato production. Most of the 40,000 acres of private land around the park are used for grazing and alfalfa production. Livestock grazing is important to the regional economy, and there are 15 ranches in operation. All public lands in and around the park are divided into grazing allotments, and the area relies heavily on federal rangelands. The U.S. Forest Service and National Park Service administer nine allotments in and around the park. The heaviest cattle and sheep grazing occurs from June through October.

Mining, Oil and Gas Leasing During the past 120 years, many mineral commodities have been extracted from mines in the northern portion of the four-county region. Tungsten and gold have been the highest yielding commodities. Lesser amounts of silver, lead, zinc, and copper have been extracted, along with small quantities of garnet, marble, and quartzite used as decorative stone. Beryllium, fluor spar, gypsum, and leasable salines such as sodium and potassium have also been removed by small mining operations. There are currently nine mining districts and a limestone quarry in the Snake Range and 15 patented claims or claim groups covering approximately 1,000 acres in the park vicinity.

Beginning in the late 1860s and extending until the park's creation, prospecting and mining occurred in several areas of the park. Numerous claims were filed around Mt. Washington, in upper Strawberry Creek, and in upper Snake Creek. Some of these claims were filed as recently as the 1950s. None of the mines in the park produced enough high-quality ore to be commercially successful, although several resulted in extensive exploratory excavations.

Geologists have determined that the Snake and Spring valleys have favorable subsurface environments for the formation of oil and gas resources. Therefore, oil and gas lease applications cover all of Spring Valley and most of Snake Valley. There have been no reported discoveries of oil or gas to date, although exploration and drilling activities have been occurring for some time in both valleys.

Forestry No large-scale commercial timbering occurs in the South Snake Range, but forest products are used by local residents and commercial operators. Residents and operators cut Christmas trees and gather down and dead wood for firewood. Local people occasionally cut higher elevation tree species under permit for construction of log homes, cut junipers for fence posts, and harvest pinyon nuts. The most heavily used forest lands in the area are near Sacramento

Pass, where access is easiest, and near the Utah border, where slopes are gentle.

A number of Forest Service and Bureau of Land Management special use permits have been issued in the park vicinity for road building, powerline easements, microwave stations, telephone relay stations, pipelines, small water diversions, and reservoirs. Currently, a major east/west transmission corridor with two 230KV lines goes through the Sacramento Pass area.

**Special
Use
Permits**

Visitors to the Great Basin region can find basic services in Baker, Nevada, a small community that supports two motels with 21 rooms, three restaurants, a general store, and a gas station. The towns of Ely, Delta, and Beaver (119 miles east in Utah) provide a greater range of services including motels, restaurants, gasoline and automotive services, grocery and convenience stores, clothing stores, and banks. The nearest medical services are in Ely.

**Recreation
and
Tourism**

Following are the some of the major recreational attractions within a 100-mile radius of Great Basin National Park (see the Recreational Opportunities map for locations).

Nevada

Spring Valley State Park (18 miles east of Pioche) - 65 acres of surface water; boating, camping, and picnicking

Echo Canyon State Recreation Area (17 miles east of Pioche) - boating, camping, fishing, and picnicking

Cathedral Gorge State Park (2 miles south of Panaca) - high walls of gray/tan eroded bentonite formations

Kershaw-Ryan State Park (3 miles south of Caliente) - cliffs and canyons; picnicking and camping

Ward Charcoal Ovens State Historic Site (near Ely) - stone beehive ovens from early charcoal production

Beaver Dam State Park (35 miles northeast of Caliente) - mountain setting of pine forests and cliffs, hunting, fishing, camping, and hiking

Utah

Fish Springs National Wildlife Refuge (23 miles east of Calico on the Pony Express Trail) - 18,000 acres of marshland, excellent for birdwatching

Minersville State Park (12 miles west of Beaver) – 1,100-acre reservoir; boating and camping

Other attractions within a 100-mile radius of the park include Fort Deseret, Gunnison Massacre National Monument, the territorial statehouse in Fillmore, the old Cove Fort, the old Frisco mining town, and the old Pony Express route. Within a day's drive are Red Canyon in Dixie National Forest, Cedar Breaks National Monument, and Bryce Canyon National Monument.

Hunting and fishing are major activities throughout the four-county region. Mule deer, elk, and grouse are hunted in the mountains; pronghorn antelope, chukar, and quail are found in desert and foothills areas. Trout fishing occurs in most major perennial streams, and bass fishing is popular at reservoirs in the region. There are 28 public and private campgrounds in a 110-mile radius of Great Basin National Park with a combined total of 788 sites.

The following observations can be drawn from this information:

From 1975 to 1987 the region's population increased by 16 percent, significantly less than the Nevada increase (62 percent) and the Utah increase (36 percent).

From 1980 to 1985 the region's population increased by 21 percent compared to a 16 percent increase for Nevada and a 12 percent increase for Utah.

Between 1985 and 1987 the region's population decreased by 2,000 residents.

The four-county region remains sparsely populated. In 1987 the region had a population density of 1 person per square mile, as compared with 91 persons per square mile for Nevada and 198 persons per square mile for Utah as a whole.

POPULATION

Regional patterns of population growth and change reflect differences among regions in their ability to attract and retain people as both producers and consumers. Population growth for the four-county region surrounding Great Basin National Park can be put into perspective by comparing the region's population index with indexes for Nevada and Utah.

TABLE 7: POPULATION AND POPULATION INDEXES – 1975-1987

Year	Nevada (000)	Utah (000)	Region (000)	Nevada Index	Utah Index	Region Index
1975	619.8	1,233.9	24.8	100.0	100.0	100.0
1976	646.8	1,272.4	24.8	104.4	103.1	100.0
1977	678.1	1,316.4	24.1	109.4	106.7	97.2
1978	719.3	1,364.2	25.0	116.1	110.6	100.8
1979	765.1	1,416.1	24.8	123.4	114.8	100.0
1980	809.9	1,472.6	25.6	130.7	119.3	103.2
1981	845.8	1,515.6	26.9	136.5	122.8	108.5
1982	878.1	1,558.0	27.5	141.7	126.3	110.9
1983	896.9	1,596.0	28.4	144.7	129.3	114.5
1984	916.8	1,623.8	30.0	147.9	131.6	121.0
1985	936.5	1,645.1	30.9	151.1	133.3	124.6
1986	967.4	1,664.3	30.0	156.1	134.9	121.0
1987	1007.3	1,680.0	28.9	162.5	136.2	116.5

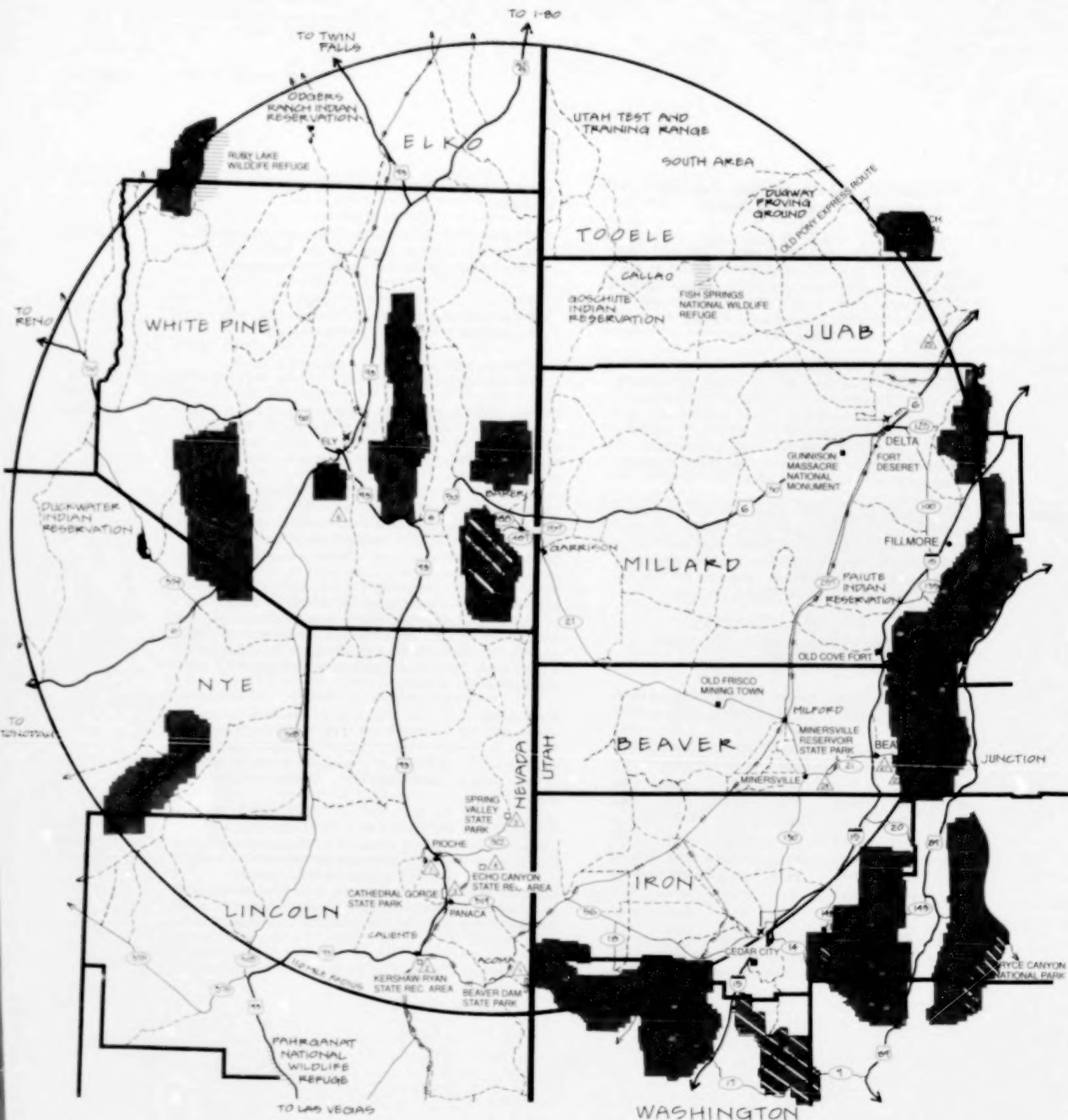
ECONOMY

From the early 1900s the Great Basin region supported a stable mining and agricultural economy. Gold, silver, and copper mining flourished for approximately 70 years until falling mineral prices, increasing foreign competition, and increasing operating costs brought about its decline in the 1970s. Agriculture grew along with the mining industry, as settlers established small farms and ranches to provide food for the mining operations scattered throughout the region. Although the lifestyles associated with mining and ranching continue, the economic focus of the region has diversified to a point where mining and agriculture are no longer the only mainstays of the economy.

Three factors have been considered in evaluating current economic conditions and trends in the four-county Great Basin region – total personal income, per capita income, and employment. For consistency of analysis, all income and industry earnings figures have been converted to 1989 dollars.

The growth and change of total personal income is a measure of the vitality of a region's economy. Increases over time in real (inflation adjusted) total personal income serve as an indicator of overall regional economic growth. Economic growth for the four-county region can be evaluated by comparing the region's income index with similar indexes for Nevada and Utah. Table 8 compares these indexes.

Total
Personal
Income



RECREATIONAL OPPORTUNITIES GREAT BASIN REGION

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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Economy

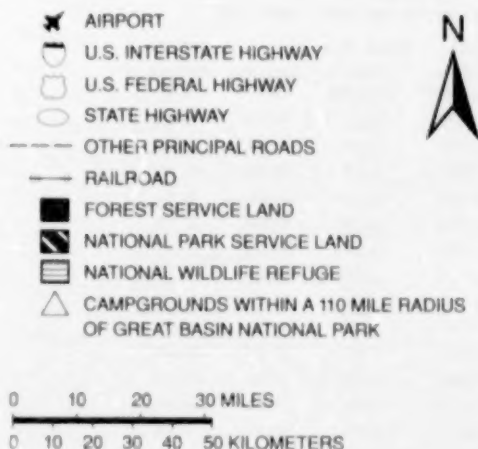


TABLE 8: TOTAL PERSONAL INCOME - 1975-1987

Year	Nevada Deflated (000\$)	Utah Deflated (000\$)	Region Deflated (000\$)	Nevada Index	Utah Index	Region Index
1975	7,126,637	10,397,583	199,186	100.0	100.0	100.0
1976	7,740,339	11,204,487	193,730	108.6	107.8	97.3
1977	8,473,750	11,975,247	200,262	118.9	115.2	100.5
1978	9,824,426	12,891,184	213,260	135.0	124.0	107.1
1979	10,254,820	13,413,702	205,711	143.9	129.0	103.3
1980	10,681,483	13,522,100	221,543	149.9	130.1	111.2
1981	11,055,382	13,873,875	230,004	155.1	133.4	115.5
1982	10,956,163	14,091,124	224,892	153.7	135.5	112.9
1983	11,142,838	14,407,024	241,814	158.4	138.6	121.3
1984	11,728,389	15,195,057	276,117	164.6	146.1	138.6
1985	12,366,729	15,691,913	301,888	173.5	150.9	151.6
1986	13,087,681	15,996,969	286,416	183.6	153.9	143.8
1987	13,819,828	16,007,808	270,177	193.9	154.0	135.6

Table 8 provides the following information:

From 1975 to 1987 the region's personal income increased by 36 percent in real terms. This is significantly less than the Nevada increase (94 percent) and the Utah increase (54 percent).

From 1982 to 1985 total personal income in the region increased by 34 percent in real terms compared to a 13 percent increase for Nevada and a 11 percent increase for Utah.

Between 1985 and 1987 the region's total personal income decreased by \$31.7 million.

Table 9 shows the sources of earned income by place of work in 1987. Comparison of the sources for the four-county region indicates that the region's economy is much more natural resource dependent than either Nevada or Utah as a whole, particularly in terms of agriculture, mining, and electrical power generation. The region's manufacturing sector is less developed than Utah's and its service sector is less developed than Nevada's.

NSP = NEVADA STATE PARK
CITY = CITY PARK
USP = UTAH STATE PARK
FS = US FOREST SERVICE
PRIV = PRIVATELY OWNED
BLM = BUREAU OF LAND MANAGEMENT

NEVADA CAMPGROUNDS

TYPE	NAME	NEAREST TOWN	# SITES
1 NSP	BEAVER DAM STATE PARK	CALIENTE	52
2 NSP	KERSHAW-RYAN STATE RECREATION AREA	CALIENTE	12
3 NSP	CATHEDRAL GORGE	PANACA	22
4 NSP	ECHO CANYON RESERVOIR	PIOCHE	34
5 NSP	SPRING VALLEY	PIOCHE	42
6 NSP	WARD CHARCOAL OVENS	ELY	6
7 CITY	PIOCHE RV	PIOCHE	10
8 NSP	CAVE LAKE STATE RECREATION AREA	ELY	20
9 BLM	CLEVE CREEK	ELY	6
10 FS	TIMBER CREEK	ELY	6
11 FS	WARD MOUNTAIN	ELY	22
12 FS	CURRENT CREEK	CURRENT	7
13 FS	WHITE RIVER	CURRENT	4
14 BLM	GARNET HILL	ELY	3
15 BLM	ILLIPAH RESERVOIR	ELY	8
16* PRIV	ROA OF ELY	ELY	140
17* PRIV	LANES RANCH MOTEL	ELY	15
18* CLM	MEADOW VALLEY	ELY	6
19* PRIV	PIONEER RV LODGE	ELY	8
20* PRIV	RAINBOW RV PARK	ELY	10
21* PRIV	VALLEY VIEW RV PARK	ELY	68

UTAH CAMPGROUNDS

22 FS	HONEYCOMB ROCKS	ENTERPRISE	23
23 FS	KENTS LAKE	BEAVER	17
24 USP	MINERSVILLE	BEAVER	29
25 BLM	LITTLE SAHARA REC AREA	OASIS	84
26 BLM	SIMPSON SPRINGS	VERNON	20
27 PRIV	BEAVER CANYON	BEAVER	105

TABLE 9: SOURCES OF EARNED INCOME BY PLACE OF WORK - 1987
(1989 DOLLARS)

Source	Nevada (000\$)	Utah (000\$)	Region (000\$)	Nevada Percent	Utah Percent	Region Percent
Farm	63,236	212,634	22,954	0.5	1.3	8.5
Other	56,924	42,413	1,148	0.4	0.3	0.4
Mining	347,841	340,080	24,480	2.6	2.1	9.1
Construction	1,118,909	1,041,248	24,053	8.3	6.5	8.9
Manufacturing	640,359	2,619,005	8,446	4.7	16.4	3.1
Transp./Pub. Util.	963,921	1,353,090	46,328	7.1	8.5	17.1
Trade	1,945,187	2,518,142	26,801	14.4	15.8	9.9
Fin./Ins./Real Est.	622,546	893,191	4,430	4.6	5.6	1.6
Service	5,776,796	3,572,509	64,845	42.6	22.4	24.0
Government	2,011,745	3,389,659	46,760	14.8	21.2	17.3
Total	13,547,464	15,981,970	270,244	100.0	100.0	100.0

**Per Capita
Income**

Per capita income serves as a general indicator of the economic well-being of area residents. While increases over time in real (inflation adjusted) total personal income serve as an indicator of overall regional economic growth, increases in real per capita income indicate that individual well-being has improved in the region. The region's per capita income figures, as shown in table 10, represent a weighted average based on the population of the four counties.

TABLE 10: PER CAPITA INCOME - 1975-1987

Year	Nevada Deflated	Utah Deflated	Region Deflated	Region /NV	Region /UT
1975	11,498	8,427	8,032	69.9%	95.3%
1976	11,967	8,806	7,812	65.3%	86.7%
1977	12,496	9,097	8,310	66.5%	91.3%
1978	13,380	9,450	8,530	63.8%	90.3%
1979	13,403	9,472	8,295	61.9%	87.6%
1980	13,189	9,182	8,654	65.6%	94.2%
1981	13,071	9,154	8,550	65.4%	93.4%
1982	12,477	9,040	8,178	65.5%	90.5%
1983	12,424	9,027	8,506	68.5%	94.2%
1984	12,796	9,358	9,204	71.9%	98.4%
1985	13,205	9,539	9,770	74.0%	102.4%
1986	13,529	9,612	9,547	70.6%	99.3%
1987	13,720	9,528	9,349	68.1%	96.1%

The table 10 figures indicate the following:

Between 1975 and 1987 the region's real per capita income tended to remain below both Nevada's and Utah's, averaging 33 percent less than Nevada's, 6 percent less than Utah's, and 25 percent less than the U.S. as a whole.

During the period from 1982 to 1985 the region's real per capita income increased relative to Utah's and exceeded the state average for Utah in 1985.

Between 1985 and 1987 the region's per real capita income decreased by \$526.

The service industries, retail trade sector, and local, state, and federal governments are the region's principal employers, with over two-thirds of the nonagricultural wage and salary work force. The transportation and public utility sector accounts for an additional 10 percent of the work force, and mining and construction split 10 percent. Table 11 and figure 1 summarize employment by major industry for the four-county region.

Employment

TABLE 11: REGIONAL EMPLOYMENT - 1982/1985/1987

Sector	1982 Jobs	1985 Jobs	1987 Jobs
Farm	1,700	1,639	1,634
Other	87	85	94
Mining	690	733	645
Construction	617	2,818	741
Manufacturing	610	468	413
Transp./Pub. Util.	591	976	1,109
Trade	2,373	2,673	2,531
Fin./Ins./Real Est.	441	417	437
Service	2,518	3,025	3,063
Government	2,300	2,463	2,506

Analysis of regional employment figures indicates four major changes in the region's economy between 1982 and 1987:

a 357 percent increase in the construction sector between 1982 and 1985; this construction activity has since subsided, and employment has returned to near 1982 levels

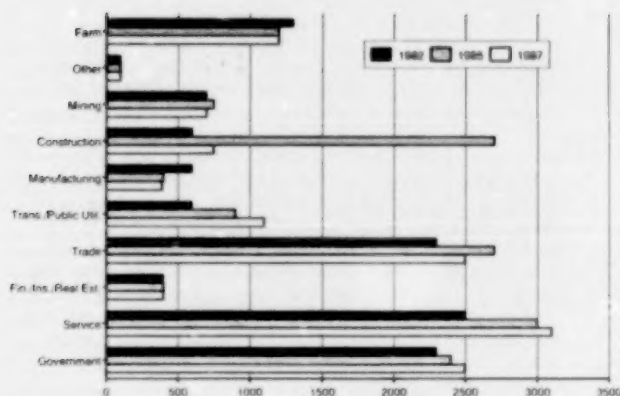
a 32 percent decline in the manufacturing sector, primarily in the primary metal industries

an 88 percent expansion of the transportation and public utilities sector, primarily in the electrical services industry

a 22 percent increase in the service sector, primarily due to increased business services

A fifth change in the region's economy has been the establishment of Great Basin National Park. However, since the park was not established until 1986, the data are not current enough to fully reflect this change.

REGIONAL EMPLOYMENT BY MAJOR INDUSTRY



PARK ENVIRONMENT

NATURAL ENVIRONMENT

Climate

Great Basin National Park lies in a cold desert climate. Cold deserts are characterized by cold, harsh winters, low precipitation scattered fairly evenly throughout the year, and great extremes in both daily and seasonal temperatures. Typically, winters are cold and relatively dry with occasional snow or rainfall from storms coming predominately from the west off the Pacific Ocean. Because of the rain shadow effect created by the Sierra Nevada range, only the strongest storms contribute much precipitation. Summers are generally hot and dry with frequent mountain thunderstorms. There is a wide elevation range within the park and a corresponding range of mean temperatures and rainfall. Higher elevations have much greater annual precipitation and lower mean annual temperatures.

Air Quality and Visual Resources

Air quality in the vicinity of the park is excellent at the present time. Until it was shut down, the single major stationary source of air pollution was the copper smelter at McGill, Nevada, approximately 35 miles northwest. At present, the Intermountain Power Project coal-fired power plant at Lynndyl, Utah, 100 miles northeast of the park, is the nearest major air pollution source. Future sources could include several proposed coal-fired power plants, including the White Pine County plant (1,500 mW), to be located near Ely, Nevada, 35 miles northwest of the park, the Thousand Springs plant (2,000 mW), 150 miles north, the Harry Allen plant (2,000 mW), 140 miles south, and a plant (unknown mW) to be located next to the existing Gardner power plant on the Moapa Indian Reservation, 135 miles south of the park. A number of hazardous waste incinerators are also proposed, the closest of which would be located on the Utah-Nevada border on the Goshute Indian Reservation, 50 miles north of the park.

The park also has exceptional visual quality. The central southwest, including eastern Nevada, generally has the best visual quality anywhere in the United States. Mean standard visual ranges greater than 120 miles are noted throughout the year, with the best visibility occurring during the winter (for example, the median visual range at Great Basin during the winter of 1987 was 182 miles. Air Resource Specialists, 1986, 1988). These visibility data are confirmed by data regarding fine particles, which play a major role in visibility impairment. The lowest average fine mass concentrations nationally occur in an area extending from northern California

and southern Oregon to the Four Corners region, including eastern Nevada (Cahill, Eldred, and Feeney 1986).

Although the present visual quality at Great Basin is excellent, even slight increases in air pollutant concentrations could cause major decreases in visibility. Similarly, night sky vistas could be significantly diminished by artificial light or visibility-reducing pollutants at developments in the park vicinity. The park (and previously Lehman Caves National Monument) has been monitoring visibility for several years. From 1982 to 1987 park staff operated a manual teleradiometer, a 35mm camera, and a fine particulate (dichotomous) sampler. The teleradiometer and camera recorded the visibility from the park to four targets - Mount Moriah (18 miles), Conger Mountain (30 miles), Notch Peak (44 miles), and Peak 8070 (37 miles) - three times a day. In 1987 the teleradiometer was replaced with an automated visibility monitoring station. Under the auspices of the NPS visibility monitoring and data analysis program, this station is also part of the interagency monitoring of protected visual environments (IMPROVE) program.

In addition to monitoring the visual range observable from the park, since 1985 the park (and formerly Lehman Caves National Monument) has operated a national atmospheric deposition program (NADP) sampler. This site collects precipitation samples, which are analyzed for pH, conductivity, and chemical composition. Since the automatic air quality camera reveals only the presence of particulate pollution, the NADP samples are extremely important for revealing nonvisible air pollutants.

The landscape of the South Snake Range is one of contrast. In the central portion are mountains, heavily timbered at mid elevations, that extend above timberline and are capped by alpine vegetation. Rising to over 12,000 feet, some of the summits are broad and rounded, others are glaciated with sharp, jagged peaks. Creek valleys are generally steep and narrow. At the southern end of the range many of the creeks lie in deep canyons. Surrounding the range on both the east and west sides are broad, flat, sparsely vegetated valleys. These valleys were once the floors of two separate lakes that have now evaporated.

Topography,
Geology,
and
Soils

Igneous and sedimentary rocks of varying ages form the South Snake Range. Some of the park, including the main developed area around Lehman Cave, is underlain by limestone deposits containing numerous caves. Quartzites and quartz monzonites form the base of the range and often are exposed at the surface.

The park has a geologic history representative of the eastern Great Basin. The mountains of western Utah as well as the South Snake Range contain large amounts of limestone, which was deposited on the floor of a warm, shallow sea during the Paleozoic era (between 600 and 245 million years ago). Fossil remains of marine organisms are occasionally present in the park's limestone formations.

Conditions changed in the Mesozoic era (between 245 and 67 million years ago) when the Great Basin region was uplifted and the former sea floor emerged as land and was gradually eroded. As the South Snake Range was elevated, it formed a large dome-shaped structure. Sedimentary formations in the upper section of Paleozoic rocks were stretched, eventually detaching from the rising dome and sliding down the sides, forming low-angle thrust faults.

Beginning about 45 million years ago and extending until 17 million years ago, volcanism dominated much of the Great Basin, and huge eruptions of ash and lava flows changed the landscape. Although volcanic rocks illustrate an important part of Great Basin's geologic history, none occur within the park boundary. There are some tertiary volcanics at the extreme southern end of the South Snake Range, about 10 to 12 miles south of the park.

Seventeen million years ago marked the end of volcanism and doming of the South Snake Range and the beginning of a change in geologic forces. At that time the earth's crust in what is now western Utah and most of Nevada began to uplift and stretch in reaction to a new stress. The crust cracked into great north-south aligned faults, which still move and continue to shape the Great Basin today. The geophysical causes of this new mode of deformation are still being debated, but the result - the alternating ranges and valleys that make up the Great Basin landscape - is obvious. The South Snake Range, which is the backbone of the park, is bound on its east and west sides by faults. Earthquakes attest to the movement along these faults that continues to elevate the range in relation to the adjacent Snake and Spring valleys.

Geologic processes at fairly recent times placed the finishing touches on the park's landscape. Erosion of the South Snake Range accompanied uplift, tearing down the mountains and depositing rocky debris as alluvium in the valleys and along the toes of the mountain slopes. The groundwater present in limestone formations dissolved some of the rock, forming solution caverns such as Lehman Cave and refilling parts of the caverns with crystalline deposits of great beauty.

During the cool, moist Pleistocene epoch, when large pluvial lakes filled the east and west margins of the Great Basin, the water level of Lake Bonneville on the east margin rose so high that it flooded several of Utah's valleys and reached its maximum westward extent in the Snake Valley, only 5 miles northeast of the park. To the west a much smaller but very deep lake filled Spring Valley. Today these valleys are composed of pluvial lake deposits and alluvium. The gentle hills approaching the base of the South Snake Range are primarily old alluvial deposits of varying origins.

The cool climate of the Pleistocene provided sufficient snowfall in the South Snake Range for alpine glaciers to form. Many of the high mountain valleys were deepened and scoured by moving ice. The glaciers also left behind jagged cirques, moraines, and small mountain lakes, providing an alpine appearance seemingly out of place in the arid region. The remnant glacier and rock glacier in the Wheeler Peak cirque are reminders of this climatic change.

A systematic soil survey has not been completed for Great Basin National Park. In general, the soils of the region reflect the moderate complexity of the parent material. They are fairly deep where formed over alluvium and quite shallow on hillsides. Most are excessively well drained. At elevations above timberline, soils are very poorly formed and often exist only in isolated pockets protected from the erosive effects of wind. The various soils, particularly those formed from limestone, often have specific plant communities associated with them.

The park has numerous small permanent and intermittent streams originating at higher elevations in the South Snake Range. The larger streams are on the east side of the park because of the more gradual elevation gradient and larger catchment basins on that side. Many of the smaller streams disappear into the ground before flowing out of the park. The larger streams usually flow out of the park and into the valleys on either side. There they evaporate, percolate into

Water
Resources
and Water
Quality

the substrate, or are channelled into irrigation ditches for use in valley ranches.

Baker and Lehman creeks are the two largest drainages in the park. The mean annual water yields on these creeks are 6,177 and 3,576 acre feet, respectively. Most of the water in the larger park streams is used by surrounding ranchers for stock watering or agricultural uses. The South Fork of Big Wash has been identified by the Park Service as being eligible for designation as part of the national wild and scenic rivers system.

There are six subalpine lakes in the park near the crest of the South Snake Range. All of these lakes are small and shallow, and all are on the east side of the range. The lakes receive most of their water from springs and subsurface water flow. During spring runoff the lakes rise to their highest levels and the water flow out and into the permanent streams. After the runoff the lakes decrease in size through evaporation and subsurface seepage.

Because of the geological complexity of the area, the characteristics of groundwater flows are largely unknown; however, it is obvious these flows are significant and play an important role in hydrologic transport. There are numerous springs in the park, some of which hold surprisingly large quantities of water. In addition, there are many large springs on both sides of the South Snake Range in Spring and Snake valleys. These springs are obviously linked by groundwater flows to the catchment basins of the South Snake Range. The groundwater flows are also critical in the formation and maintenance of the numerous limestone caves within the park.

Both Spring and Snake valleys contain substantial underground aquifers with very large groundwater reserves.

The water quality of the streams of the park has not been extensively studied. Data gathered recently by the Environmental Protection Agency indicate that the water quality of the park's alpine and subalpine lakes is exceptionally good and it is likely that the high elevation streams possess similarly pure water. Lower elevation streams flow through riparian zones subjected to grazing, and it is suspected that water quality in these streams is degraded. The extent of this degradation is not known. Research and monitoring activities are currently underway at the park to obtain this information.

Most of the water that originates in the park is allocated by the state of Nevada for use by private individuals for agriculture and livestock watering on the ranches in Snake and Spring valleys. In general, the major uses for water and most points of diversion for taking water are outside the park boundary. Because of this, and with few exceptions, water flows through the park before being diverted, leaving the park's streams with naturally occurring water flows. One exception is lower Snake Creek, where water is diverted within the park and piped for about 3 miles across a permeable streambed, leaving the lower portion of the natural stream channel dry for much of the year.

Nevada's water law is based on the doctrine of prior appropriation. Under this doctrine, the entity that first diverts water for a beneficial use has the prior right to use the water, against all other appropriators that may wish to use the water later. The federal government may also hold federal reserved water rights, which arise from the purposes for which the land is reserved. When the federal government reserves land for a particular purpose, it also reserves, by implication, enough water unappropriated at the time of the reservation as is necessary to accomplish the purposes for which Congress or the president authorized the land to be reserved, without regard to the limitations of state law.

Within the park, water for visitor and administrative uses in the headquarters area is provided by an appropriative water right for Cave Spring - the same right that provided for the use of water to meet visitor and administrative needs at the former Lehman Caves National Monument. This water right was decreed in a 1934 adjudication, at which time the surface water rights in the Lehman and Baker Creek stream systems were determined.

The act that established Great Basin National Park specified that no new federal reserved water rights were created with the creation of the park. Reserved rights are limited to those associated with the initial establishment of Humboldt National Forest and Lehman Caves National Monument. Reserved water rights for national forest purposes apply on all former national forest lands reserved from public domain, which constitute most of the park.

Sufficient water for all wildlife, stock, and visitor needs would likely not be provided through the exercise of reserved water rights. Therefore, appropriative water rights would likely be required for these types of uses. Water systems in three of the campgrounds that the Park Service acquired from the Forest Service are fed by springs in the Baker/Lehman

Creek system. No rights were claimed for these springs in the 1934 adjudication, and it appears that no new surface water rights will be granted in this fully appropriated stream system. The extent of groundwater appropriation is not known.

Following a 1988 Nevada Supreme Court decision, federal agencies' water right applications for land management functions that are recognized as beneficial uses under Nevada law (for example, recreation, stock watering, and wildlife watering) will be treated on equal basis with applications by private landowners. To date, the Park Service has not applied to the state for water rights for these uses.

The extent of water appropriation in basins other than Lehman and Baker creeks will not be known until the rights in these basins are adjudicated.

Vegetation

The evolution of the vegetation in the park is linked to the geologic history of the area. About 130 million years ago the western half of North America was a level plain largely covered by a shallow sea, with tropical forests on dry land. The climate was warm and moist, and tropical plants requiring a warm frost-free environment thrived. About 100 million years ago, the epicontinental sea withdrew, and there was a general uplift of the Great Basin region. This uplift caused three phenomena that had a drastic effect on the earlier tropical vegetation: a general cooling of temperature, often interrupted by warmer periods; a progressive drying due to the increasing rain shadow effect of the rising Sierra Nevada and Cascade ranges; and fluctuations between wet glacial-pluvial and warm-dry periods, especially during the Pleistocene epoch. As part of this transition to a drier and more continental climate, temperate climate plants gradually replaced those dependent on a moister maritime climate. Many of the plants migrated from Eurasia.

Between 55 million and 25 million ago, in the northern part of the Great Basin the dominant vegetation community at lower elevations was the conifer-deciduous forest and above 4,000 feet was the montane conifer forest. In contrast, the semiarid and arid conditions of the southern Great Basin produced oak woodland, chaparral, thorn forest, and other semidesert vegetation.

Between 20 million and 5½ million years ago, southern Great Basin vegetation expanded into the central and northern Great Basin, eliminating the pure conifer forests from the mountain slopes and leaving oak/conifer woodlands,

chaparral covered the lowlands. At the end of this period temperatures were distinctly higher than at present, but by 5 million years ago both temperatures and precipitation were similar to those of today. Between 4 and 2 million years ago a cooling trend began, leading to the ice ages of the Pleistocene. The flora of the Great Basin then was one of savanna and grassland, with riparian, semiarid woodland, and chaparral communities.

The Great Basin flora at the beginning of the Pleistocene was similar to that of today. There were four major glacial advances during the Pleistocene, and well-preserved geomorphic features, glacial moraines, cirques, and other glacial deposits in the area today show that glaciation was extensive in the South Snake Range. Also during this time a series of pluvial lakes formed within the valleys of the Great Basin; Lake Bonneville in western Utah and Lake Lahontan in northwestern Nevada were the largest. Conifer forests became established on some lower mountain slopes and in the parts of valleys not covered by lakes. During the warm interglacial periods shrubland and grassland communities expanded; some lowland trees died and some migrated into the uplands.

Toward the end of the Pleistocene, during a relatively warm interval from about 7,000 to 4,000 years ago, the climate became drier, the glaciers melted, many streams and rivers ceased their flow, and the evaporation of lakes exceeded the inflow, which may have caused elevational and latitudinal depression of the vegetation zones (migration downslope and to the south). Throughout the Great Basin region, the net effect of vegetational and geologic history was to produce the present high mountain "islands" of montane subalpine and alpine vegetation surrounded by low desert "seas" of sparse northern desert vegetation.

The vegetation types in and near the park today are described and illustrated on the Vegetation map. Each type consists of one or more vegetation communities, which are described separately. All information was derived from LANDSAT data on file at the National Park Service's Geographic Information System Division in Denver, Colorado.

Salt Desert Scrub/Shrub (1% of the park). This vegetation type is found on more saline soils on the valley floors that surround the park. There is very little salt desert scrub within the park, but it is widespread in the Great Basin physiographic region. It consists of two plant communities.



VEGETATION

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Natural Environment

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-  SALT DESERT SCRUB
-  NORTHERN DESERT SCRUB
-  PINYON-JUNIPER WOODLAND AND FOREST
-  MOUNTAIN SCRUB
-  DECIDUOUS FOREST AND SCRUB
-  MIXED ASPEN-CONIFER FOREST
-  CONIFEROUS FOREST
-  ALPINE TUNDRA
-  GRASSLAND
-  NON-VEGETATED



0 4 8 MILES

Winterfat – a community dominated by a single species, winterfat. This species is a small, low-growing gray green shrub with many slender flexible branches that often forms relatively dense communities in the Great Basin. The foliage and branches are an important food source for deer, rabbits, and domestic livestock.

Salt Flat – a community of very sparse vegetation and large amounts of bare ground. Salt flat communities are usually in or encircling playas where salt accumulations are extremely high. The species present are usually stunted but include shadscale, tumbleweed, winterfat, and greasewood.

Northern Desert Scrub/Shrub (5% of the park). Like the salt desert scrub, this vegetation type occupies the floors of valleys surrounding the park; however, northern desert scrub continues up the lower alluvial slopes of adjacent mountains and exposed slopes and can extend to over 11,000 feet in elevation. It includes several communities of sagebrush as well as shadscale and greasewood.

Black Sagebrush-Shadscale – a mixture of straw-colored and gray green, very low growing woody shrubs, forming an open cover and composed of black sagebrush and shadscale. This community is widely scattered from 6,600 to 11,500 feet in elevation on extremely arid, lower alluvial plains and higher mountain slopes where soils are shallow, well drained, and moderately saline to moderately alkaline.

Wyoming Big Sagebrush-Greasewood – an almost continuous cover of grayish green vegetation interspersed with yellow green woody shrubs of moderate size, composed of Wyoming big sagebrush and greasewood with a few associated grasses and some bare ground between the shrubs. Both shrubs occur in pure stands, but big sagebrush typically dominates to produce the characteristic grey green plant cover found throughout the region. This community covers extensive areas from 8,700 to 10,500 feet on barren, very arid lower alluvial plains and mountain foothills on shallow to deep, fertile, fine-textured, moist, well-drained, moderately saline to moderately alkaline soils.

Wyoming Big Sagebrush – a sparse cover of grayish green and dark brown, low- to medium-sized, evenly spaced aromatic shrubs, primarily composed of Wyoming big sagebrush, black sagebrush, and fuzzyleaf

low rabbitbrush. The Wyoming big sagebrush community occurs from 6,600 to 11,300 feet on dry, and ridges on very shallow to very deep, fertile, fine-textured, well-drained, and nonsaline soils.

Black Sagebrush – a light brown to dark brown, almost continuous cover of low-growing woody shrubs composed entirely of black sagebrush. This community is normally found from 6,600 to 11,400 feet on drier slopes above the pinyon-juniper community on shallow to deep, fertile, fine-textured, well-drained, and nonsaline soils.

Pinyon-Juniper Woodland and Forest (29% of the park). This vegetation type consists of one plant community that is often subdivided based on the prevalence of juniper within the stand or the density of the pinyon overstory.

Pinyon-Juniper – grey green to yellow green small trees growing in scattered clumps to form a dense closed-canopy forest or an open woodland with a ground cover of small shrubs, herbs, and grasses. The two principal tree species are single-needle pinyon pine and Utah juniper. The pinyon-juniper community occurs from 6,800 to 10,000 feet on warm, dry sites on upper alluvial fans and lower mountain slopes on thin rocky or gravelly soils. There is some variation in the vegetation type from the lower dry foothills to the intermediate slopes to the higher elevations, from lower to higher, there are scattered dwarf Utah junipers, larger Utah junipers intermixed with pinyon pine, and finally almost pure stands of pinyon pine.

Mountain Scrub (18% of the park). The mountain scrub type includes taller shrubs that often intermix with forest stands. This type provides significant food sources and habitat for many native birds and mammals and consists of the following three plant communities.

Mixed Shrub – an almost continuous cover primarily composed of Wyoming big sagebrush, black sagebrush, serviceberry, and snowberry, with other shrubs, grasses, and herbs growing in the openings between the shrubs. The mixed shrub community occurs on slopes from 6,700 to 10,600 feet on shallow to deep, fertile, fine-textured, well-drained, and nonsaline soils.

Mountain Big Sagebrush/Grass – As viewed in the stand, mountain big sagebrush is a moderate-sized shrub with a silvery, flat top. Growing between the

shrubs are various low-growing grasses. The mountain big sagebrush/grass community usually occurs on higher, drier slopes from 7,800 to 10,000 feet on very shallow to moderately deep soils.

Mountain Mahogany – a dark green to grey green, open to closed thicket of large shrubs in extensive pure open stands dominated by curleaf mountain mahogany, with black sagebrush, plains sagebrush or western mugwort, Michaux mugwort, Utah mountain snowberry, and antelope bitterbrush in the understory and with occasional openings containing other shrubs, grasses, and many herbs associated with the aspen forest/scrub community. Mountain mahogany is often found with pinyon pine in the transition zone between the two communities. The mountain mahogany community occurs in lower canyons and on dry mountain slopes and ridges from 7,800 to 10,300 feet on moderately deep soils or rocky substrates. It is generally on more mesic sites than the pinyon-juniper community, which is usually at somewhat lower elevations.

Deciduous Forest and Scrub (8% of the park). This vegetation type consists of riparian vegetation and aspen forest. It is often found near the mountain scrub type but is generally in more moist, less exposed environments.

Aspen Forest/Scrub – aspen trees with leaves colored medium green on top and silver green underneath, consisting of one or more clones of a parent tree and all of its sucker offspring and forming dense continuous stands with many bright white trunks. Wherever openings occur in the aspen forest canopy, scrub vegetation is found that contains various trees, shrubs, grasses, and herbs. The aspen forest/scrub community generally occurs on moist slopes and along rocky to gravelly major perennial stream beds. Aspen is found in riparian communities at higher elevations up to 8,500 feet, where it intergrades with Douglas fir, white fir, and Engelmann spruce; at lower elevations near 7,500 feet there is a general downward shift of species along the major perennial streams, that is, white fir and ponderosa pine extend downward and aspen intergrades with narrowleaf cottonwood down through the pinyon-juniper and into the sagebrush-grass communities. Aspen also occurs in scattered groves on intermediate mountain slopes and in canyons from 8,500 to 10,000 feet on broken rock slides and rock fields; in older stands it intermingles with Engelmann spruce. Finally, aspen is

found in some places at timberline (11,300 feet), occurring as a low shrub and clinging to steep rocky slopes.

Riparian Scrub - various green, lush, water-loving, densely growing, moderate-sized trees and shrubs that take various forms depending on location, including river or red birch, Engelmann spruce, quaking aspen, coyote or narrow-leaf willow, willow shrub, and Booth willow, mixed with red osier dogwood, chokecherry, narrowleaf cottonwood, blueberry or elderberry, and short young trees of Rocky Mountain maple, Engelmann spruce, and Douglas fir. Riparian scrub vegetation occurs from 7,600 to 10,000 feet on fine to coarse alluvial soils in wet substrates with a high water table along the major perennial streams and along the shores of alpine lakes in high mountain meadows.

Mixed Aspen-Conifer Forest (10% of the park). Usually found in the upper reaches of the watersheds between 8,500 and 10,000 feet, this vegetation type represents a transition zone between the wetter riparian areas and pure aspen stands and the higher and drier sites dominated by conifers. In this vegetation type, aspen are found in mixed associations with conifers. The aspen often occur in small pockets that are surrounded by conifers or as understory vegetation in relatively open conifer stands.

Coniferous Forest (17% of the park). Consisting of three vegetation communities, the coniferous forest vegetation type is found at higher elevations and at mid elevations on northern exposures.

Mixed Conifer Forest - a mixture of deep green, medium green, and blue green trees, from tall and fully formed to small and dwarfed at timberline, including Engelmann spruce, limber pine or Rocky Mountain white pine, Great Basin bristlecone pine, and some Douglas fir and white fir, with an understory of various shrubs, grasses, and herbs. The mixed conifer forest occurs from 7,800 to 11,300 feet on sites ranging from dry, rocky, southwest-facing slopes to sheltered and exposed ridges on high mountains up to timberline on moist, cool, shaded north-facing slopes on rocky or coarse soils. At intermediate elevations, white fir usually dominates in canyons and on shady slopes, but Douglas fir dominates in some isolated areas, such as in Lexington Canyon and in upper portions of the Snake Creek drainage. Typically, Douglas fir and white fir are most common in the moister lower elevation sites, and

some ponderosa pine also intermix in a few locations, especially in the upper elevation riparian areas.

Spruce Forest - a tall, dense, dark green forest consisting of Engelmann spruce, with some scattered limber pine. Openings in the spruce forest canopy contain shrubs, grasses, and herbs. The spruce forest community occurs on open, exposed rocky slopes from 8,400 to 10,800 feet on moist substrates extending up to timberline. Timberline is abrupt, at elevations between 11,300 feet on the west and 10,800 feet on the east, and vegetation is characterized by leaning, fallen, and dwarfed shrublike forms of Engelmann spruce, with a few limber pine. A few stunted spruce trees are found in the alpine tundra above timberline.

Bristlecone Pine/Limber Pine - dark to medium green Great Basin bristlecone pines occurring in a number of conditions. "Unstressed" trees form open woodlands with understory vegetation or grow together with limber pine or Engelmann spruce, such as on the slopes of Mt. Washington. Single, gnarled "stressed" trees are found in open groves, such as in the Wheeler Peak cirque population, or as low-growing, dwarfed shrublike krummholz at timberline. The understory is often absent. The bristlecone pine/limber pine community occurs just below timberline (from 10,200 to 11,300 feet) in the highest canyons and on high, dry rocky mountain slopes and ridges facing all four points of the compass. The pines generally grow on broken rock fields and boulders composed of limestone. An exception is Wheeler Peak, where the substrate is a jumbled mass of blocky, quartzite boulders.

Alpine Tundra (8% of the park). This vegetation type contains only one community.

Alpine Tundra - variously colored and textured, primarily small low-growing perennial herbs, including woody shrubs like prostrate juniper, mountain currant, cushion plants like pygmy bitterroot and moss campion, sedums like yellow stonecrop and red stonecrop, various lichens, and alpine club moss, covering less than 35 percent of the broken rock scree, talus slopes, and fellfields. Where sufficient soil development has occurred, some shrubs and grasses find a foothold, including Holmgren's buckwheat. Grasses, sedges, and dwarf wildflowers form turf in alpine meadows, including alpine fescue grass, alpine timothy, skyline bluegrass, Sandberg bluegrass, elk sedge, Mountain hare sedge, alpine

tufted phlox, phlox, Nevada primrose on limestone substrates, and dwarf plainleaf buttercup. Occasionally beyond the tree limit are found stunted forms of Engelmann spruce, bristlecone pine, and limber pine. Sometimes dense mats of herbs form along snowmelt seeps and streamsides, containing such plants as the snowbed buttercup and sibbaldia.

The alpine tundra community occurs between 10,000 and 12,300 feet on the highest, driest mountain ridges and slopes and on gentle to steep crests and ridges. Plants generally grow on sites exposed to the wind, where snow is blown away, on gravelly to rocky substrates that do not hold water or allow it to accumulate.

Grassland (3% of the park). The grassland vegetation type includes the grassland/agriculture community.

Grassland/Agriculture - low-growing clumps or mats of yellow green to medium green agricultural and irrigated pasture vegetation, with no overstory and only a few herbs intermingled, containing perennial wheatgrass and other seedings for supplemental spring and fall cattle forage. Around wet seeps and springs, there are grasses and sedges. The mountain meadows contain a combination of grasses, herbs, sedges, and wildflowers. Various species introduced through human activities occur especially along roadsides, including tall wheatgrass, flaxweed, halogenten, and field sowthistle. The grassland/ agriculture community occurs between 7,000 and 10,700 feet on gently sloping to almost level land on deep, moist, fertile, fine-textured, and well-drained soils.

Other Unvegetated Areas - Bare Ground/Rock (1% of the park). This category includes steep slopes and rugged mountain crests from 7,000 to 12,600 feet, composed of exposed bedrock or bedrock covered with broken rock scree, with colonies of various dull green, brown and yellow brown lichen occasionally coloring the rock surfaces, and bare ground in other places at the lower elevations.

**Rare and
Sensitive
Plant
Species**

Because of the isolation of the South Snake Range from other temperate areas, evolutionary processes have produced unique ecotypic variations of plant species. As a result, many rare and endemic plant species are suspected to be in the park. Field surveys have discovered the presence of several rare plants; however, the park has been only partially surveyed and range data is incomplete. In

addition, because of the limited amount of botanical study completed to date, many questions remain regarding the appropriate taxonomic classification of many plants.

There are no known federally listed plant species within the boundaries of Great Basin National Park. Candidate species for listing that are or may be present based on the presence of suitable habitat include the snow wavewing (*Cymopterus nivalis*), intermountain wavewing (*Cymopterus basalticus*), Holmgren's buckwheat (*Eriogonum holmgrenii*), tunnel springs beardtongue (*Penstemon concinnus*), and Nevada primrose (*Primula nevadensis*). A brief description of these species follows.

Snow wavewing is a small perennial herbaceous plant in the carrot family that grows in the subalpine and alpine areas of the park and flowers in July. Its common name suggests the snowy mountainous areas in which it lives. It grows on dry, rocky sites often in very steep terrain. Within the park, known populations are around Pyramid Peak, Mt. Washington, and south along the South Snake Range to about Lincoln Peak.

Intermountain wavewing is a small, white-flowered perennial herbaceous plant also in the carrot family that grows in the pinyon-juniper plant community. It is not known to exist within the park; however, it is documented just to the north of the park boundary in the vicinity of Sacramento Pass. Because of the extensive amounts of pinyon-juniper habitat in the park, it is likely that populations of this species exist.

Holmgren's buckwheat is a small, dense, mat-forming woody perennial in the buckwheat family that grows in the alpine areas of the park and flowers from June to August. Its habitat is rock crevices, quartzite ridges, around limestone boulders, and talus slopes. It is commonly associated with snow wavewing and has approximately the same range within the park.

Tunnel springs beardtongue is a small perennial herbaceous plant. Historically, this species is known to have occurred along Snake Creek within the park at elevations between 7,500 and 8,000 feet. Little is known about this species and recent documentation of its presence or range is lacking. For the purposes of this plan, this species is assumed to still be within the park.

Nevada primrose is a small perennial herbaceous plant in the primrose family that has a unique and very showy purple flower with a bright yellow interior that blooms from late June

to August. It primarily occurs along limestone ridges in the high alpine areas of the park, especially around Mt. Washington.

The Nevada Natural Heritage Program maintains a list of plant species that it considers to be threatened or worthy of additional concern. There are two additional species on the list that are not listed as federal candidate species but are present within the park. These species are Nachlinger's catchfly (*Silene nachlingerae*) and Pennell's penstemon (*Penstemon francisci-pennellii*). Nachlinger's catchfly is a small perennial herbaceous plant that blooms from late May through June in the high elevations of the park. Its habitat is dry, rocky ridgetops usually on limestone. Within the park it is known to occur along the alpine limestone ridges around Lincoln Peak. Pennell's penstemon is a herbaceous perennial that occurs in upper Snake Creek and near Teresa Lake in the Lehman Creek drainage. This species grows in a wide elevational band between 7,000 and 11,000 feet. Its habitat is exposed meadows and sunny areas in riparian areas.

Wildlife

Essentially a temperate ecological island in the middle of a cold desert, the South Snake Range supports a wide variety of wildlife not found in the basins to the east and west. Resident large mammal species include mule deer, Rocky Mountain bighorn sheep, mountain lion, bobcat, ring-tailed cat, coyote, fox, skunk, badger, weasel, porcupine, jackrabbit, and beaver. Numerous smaller mammals such as squirrels, mice, and bats are also present.

Bird species are equally numerous. Permanent resident species include Clark's nutcracker, Steller's jay, scrub jay, horned lark, water ouzel, chickadee, sage grouse, blue grouse, sparrow hawk, red-tailed hawk, marsh hawk, and great horned owl. Many other birds are seasonal residents that breed within the park. Most of the bird species inhabit a particular altitudinal or ecological zone for which they are best adapted, but many occupy several different zones at various times of the year.

Threatened and Endangered Wildlife Species

Federally listed threatened and endangered species that occur or may occur within the park include the endangered bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*). No critical habitat for these species is known to exist within the park (letter from U.S. Fish and Wildlife Service, 1989; see appendix D).

The bald eagle is considered to be an occasional spring/fall migrant to the park. A 1976 sighting of one mature bald eagle represents the only documented occurrence in the park.

The peregrine falcon migrates along the mountain ranges of Nevada and is considered a spring/fall migrant to the park. No known nests have been located within the park; however, the rocky cliffs along the western boundary of the park around Lincoln Canyon are considered prime habitat for peregrine nesting.

The Nevada Department of Wildlife in cooperation with the U.S. Fish and Wildlife Service, National Park Service, U.S. Forest Service, and Peregrine Fund have initiated a reintroduction program for the peregrine for the South Snake Range. In 1988, three peregrine falcons were raised and released (a process called hacking) just to the west of the park boundary on a cliff face south of Mt. Washington. The immediate goal of the program is to establish a breeding core of falcons in that area. Additional releases are planned for future years.

Several federal candidate species being reviewed by the U.S. Fish and Wildlife Service for consideration as endangered or threatened occur or may occur within the park: the Bonneville cutthroat trout (*Oncorhynchus clarki utah*) (category 2), ferruginous hawk (*Buteo regalis*) (category 2), Swainson's hawk (*Buteo swainsoni*) (category 2), and spotted bat (*Euderma maculatum*) (category 2). State-listed species that are not federal candidate species include Koret's checkerspot (*Euphydryas editha koreti*).

The Bonneville cutthroat trout's historic range was pluvial Lake Bonneville and its tributaries, which covered parts of Utah, Nevada, Idaho, and Wyoming. This subspecies evolved in isolation from other populations of trout during the last 25,000 to 35,000 years. As Lake Bonneville dried up, populations of Bonneville cutthroat became isolated in several mountain stream systems surrounding the Bonneville Basin. Field investigations by the Nevada Department of Wildlife have identified the streams on the east side of the park as part of the trout's recent native range. Because of several factors, including the introduction of competitive alien trout species, the appropriation of water for mining and irrigation, and the overutilization of riparian areas for livestock grazing, these streams no longer support pure populations of Bonneville cutthroat. Instead, many of them are populated with introduced species such as rainbow and brown trout and eastern brook trout (actually a char).

On the west side of the park, Pine and Ridge creeks contain pure populations of Bonneville cutthroat. Somewhat surprisingly, these pure populations are outside of the historic range of the trout and apparently migrated from the streams on the east side of the park through the Osceola ditch, which ran from Lehman Creek around the north end of the South Snake Range to Hub Basin on the west side of the range and carried water for about 10 years in the late 1890s. These populations represent an important source of genetically pure Bonneville cutthroat that can be used for reestablishing this trout into other stream systems within its historic range.

The ferruginous hawk nests in valleys adjacent to the park and is probably resident to the park, although no confirmed nesting sites exist. The Swainson hawk is probably only a seasonal resident as it migrates through the park.

The spotted bat is a very rare species existing only in the western United States. Its exact range is unknown, but individual specimens have been found in areas across Nevada. Although no specimens of this bat have been discovered in the park, suitable habitat exists and it is possible that it is a resident.

The koret checkerspot is a rare butterfly endemic to the South Snake Range. Little is known about the extent of this insect's population or its exact range.

Other
Species
of Special
Concern

Rocky Mountain Bighorn Sheep. Rocky Mountain bighorn sheep were extirpated from the South Snake Range in the early 1900s. Before the arrival of Europeans, the sheep were well established and quite numerous in the area. In 1979 and 1980 the Nevada Department of Wildlife transplanted about 20 bighorn sheep from Colorado into an area west of Wheeler Peak in an attempt to reestablish a viable herd. The herd has been monitored regularly since the sheep were reintroduced. Most land that the herd uses for range is west of the park on U.S. Forest Service land. However, a large portion of the herd's summer range and lambing ground is within the park boundary to the west of and along the South Snake Range crest.

In the years since the bighorn sheep reintroduction, the herd has not multiplied as expected. In fact, recent surveys have indicated that the herd may be decreasing in size. Recent research has shown that reintroductions of bighorn sheep are rarely successful when sheep are placed on ranges that they must share with domestic sheep. The bighorn is very susceptible to diseases carried by domestic livestock and

competition for forage particularly on winter ranges. As a result, the National Park Service is not optimistic about the future of the current bighorn sheep herd within Great Basin National Park.

Elk. Like the bighorn sheep, elk almost certainly existed within the South Snake Range. Elk were first reported in eastern Nevada in 1859 near Sacramento Pass just northeast of the present park boundary. Within the park, historic records indicate summer occurrences of elk on subalpine ranges to the east of Wheeler Peak and winter occurrences south of Lexington Arch. It is believed that elk were extirpated by early settlers in the late 1800s for food and possibly to reduce competition for forage for domestic livestock.

In 1932 elk were reestablished into the Schell Creek Range of Humboldt National Forest only 8 miles east of the South Snake Range across Spring Valley. Since that time they have established a large self-sustaining herd in the Schell Creek Range. Numerous sightings and evidence of elk have been documented in the South Snake Range since 1960. It is suspected that the elk sighted are transients from the Schell Creek herd. Because of the number of transient elk entering the park, biologists consider it quite likely that elk may in the future establish a resident herd in South Snake Range.

Large Native Predators. Large predators within the park include bobcats, mountain lions, and coyotes. Before the creation of the park, these animals were often hunted for sport or to prevent stock depredations. Current populations of these species within and around the park appear to be self-sustaining and stable.

Most of the creeks and drainages of the park are subject to flash flooding during summer months when thunderstorms can produce large quantities of precipitation in localized areas. There have been no investigations or mapping of floodplains or flash-flood hazard areas within the park; however, the larger park streams are obvious hazards during flood periods. The Baker Creek, Gray Cliffs, Wheeler Peak, and Lehman Creek campgrounds have individual campsites that are quite close to creeks subject to flooding. Many individual informal campsites along Snake Creek and Strawberry Creek are also on creek banks.

Numerous small wetlands exist in the park, typically in subalpine meadows, along lakeshores, and in riparian areas. Isolated wetlands are also associated with the many springs

Floodplains
and
Wetlands

and seeps on mountain slopes. Because of the aridity of the region, these wetlands, even though quite small, are important resources for many forms of life.

CULTURAL RESOURCES

Prehistory

Evidence of aboriginal occupation in the vicinity of Great Basin National Park spans the Paleo-Indian period through the Great Basin Desert Archaic, the Parowan Fremont, and the Western Shoshone periods.

Paleo-Indian (12,000-9000 B.C.). The earliest well-dated sites in the Great Basin fall within the Paleo-Indian period. The Paleo-Indians consisted of small, mobile hunting groups that used large fluted and unfluted projectile points to hunt large Pleistocene fauna for their primary subsistence. Evidence of Paleo-Indian occupation in Smith Creek Canyon in the North Snake Range has been reported. The discovery of a Paleo-Indian point at one of the Baker guard station sites (on the property proposed for NPS administrative use) suggests Paleo-Indian use of the South Snake Range as well.

Great Basin Desert Archaic (9000 B.C.-A.D. 500). In response to climatic changes and the disappearance of the larger Pleistocene game animals, prehistoric peoples developed a broader food-gathering pattern using a variety of plant and animal products. During this period, known as the Great Basin Desert Archaic, seed-grinding implements, basketry, netting, fiber and hideoccasins, spears, digging sticks, and shell beads were all employed. Shell beads were acquired in trade with California coastal groups.

Among the excavated sites in the park vicinity that have Desert Archaic components are Danger, Newark, and Kachina caves and Swallow and Amy's shelters. Archaic evidence has been found in the park, including Pinto, Eiko, and northern side-notched points.

Parowan Fremont (A.D. 500-1300). The Parowan period covers a time span when the Great Basin was inhabited by peoples employing a sedentary horticultural lifestyle, living in small village communities or farmsteads. The Garrison site, which lies in the sagebrush flats east of the park, is an excavated Fremont village with adobe and jacal structures. Hunting and gathering, which supplemented the cultivation of crops, may be the activities responsible for some of the small artifact scatters in the pinyon-juniper association near the park entrance. Diagnostic features of the Fremont period include gray ware pottery (the most common being Snake Valley gray ware; Snake Valley corrugated postdates A.D. 1100) and a distinctive rock art style, examples of which are

found in various rockshelters and caves in the park. Projectile points found at Fremont period sites in the park include Rose Spring, cottonwood triangular, and desert side-notched points.

Western Shoshone (A.D. 1300-Present). At the time of contact with Euro-Americans, the Numic speaking Western Shoshone were dispersed into small kin groups living in seasonally occupied camps or villages near water sources in the vicinity of the park. Two such villages were near the present-day towns of Baker and Garrison. Subsistence activities centered on an annual round of gathering vegetal foods and animal hunts. Distinctive brown ware pottery and small arrow points are indicators of Shoshone occupation in the park area.

History

During the last two centuries the area encompassing Great Basin National Park played a role in many of the phases of American Southwest frontier development. The earliest Euro-American presence in the Great Basin occurred in 1776 with the Spanish expeditions of Dominguez-Escalante and Garcés. The first known Euro-American to pass near the park (via Sacramento Pass) was Jedediah Smith, a fur trapper and trader, mountain man, and explorer, in 1827. The Great Basin received increasing attention during the 1840s as the result of the widely heralded explorations of John Charles Fremont, who gave the region its name, and the reports and experiences of immigrant parties on their way to new homes in California and later of the hordes crossing the Southwest to join the California Gold Rush. First claimed by Spain and then by Mexico in 1821, the park area along with much of the Southwest became American territory in 1848 as a result of the Treaty of Guadalupe Hidalgo ending the Mexican War.

The earliest vestiges of Euro-American civilization in the park vicinity came in the 1850s. During that decade Mormons from the Utah Territory explored the area, made the first documented ascent of Wheeler Peak, and established the first agricultural settlement in Snake Valley at present-day Garrison. The decade also witnessed efforts by Howard R. Egan and James H. Simpson to establish a trail and military wagon road, respectively, across the central route of the Great Basin via Sacramento Pass.

Scientific and government studies and surveys in the region commenced during the 1860s. George M. Wheeler traversed the park vicinity during the late 1860s while conducting initial investigations that eventually developed into the United States geographical surveys west of the 100th meridian.

John Muir visited the Wheeler Peak area during the late 1870s while he was traveling through the West making observations and collecting data for his writings to promote conservation and protection of America's natural resources.

During the late 1870s and 1880s the U.S. Coast and Geodetic Survey established a triangulation station on Wheeler Peak (remnants of the station structures' rock foundations are extant) as part of its 2,500-mile geodetic connection between the Pacific and Atlantic coasts along the 39th parallel - the first large land-scale trigonometrical survey of the nation.

Mining and agricultural development in the South Snake Range and adjacent Snake and Spring valleys began in the late 1860s. As an outgrowth of the White Pine mining rush, which commenced in eastern Nevada in 1865, mining districts were first established in the South Snake Range in 1869. Eventually six mining districts were created on lands now in the park, and mines producing silver, lead, gold, tungsten, scheelite, and beryllium were developed in the park area. Today the largest and most productive mines, including the St. Lawrence, Hub, Mt. Wheeler, and Osceola placer and lode operations, lie outside the park boundary, but various mines of lesser importance are found in the park. These include the Johnson, Ponderosa, Bonita, and Chapman-Taylor mines, the Pole Canyon adit-east, and the Lincoln Canyon mine/tunnel site. Some 10 miles of the 18-mile Osceola (East) ditch, constructed in 1889-90 to carry water to the Osceola placer mining operations, are in the park, and the ditch is being recommended for listing on the National Register of Historic Places. Throughout the park are the remains of various isolated mining-related cabins or cabin groups, such as the Baker Lake cabin, Tilford Spring cabin, Young Canyon stone house, and St. Lawrence "East" and "South" cabin groups. The Johnson mill, an ore-processing facility in upper Snake Creek Canyon, and the sawmill on the south fork of Big Wash, a lumber-cutting operation, are examples of early mining-related development within the park.

The first permanent settlers entered the Snake and Spring valleys in 1869, establishing ranches and farms to provide fruit, vegetables, meat, dairy products, and other foodstuffs for the growing number of mining settlements in eastern Nevada. During the next several decades the increasing number of ranchers formed the nucleus of fledgling agricultural communities in the park vicinity, including Baker, Garrison, and Burbank. As the area's initial mining activities subsided during the 1870s, the dominant economic activity in

the park vicinity became livestock raising, and the South Snake Range provided forage for summer grazing operations for large numbers of cattle and sheep.

Absalom S. Lehman, one of the earliest settlers and ranchers in Snake Valley, discovered what would become known as Lehman Cave in about 1885. During the next six years he began developing, publicizing, and opening the caverns for tours. At the same time he planted an orchard just below the mouth of the cave and constructed a 2-mile aqueduct or ditch to convey water from Lehman Creek and several other nearby sources to his orchard and homestead. The extant remains of the orchard and aqueduct were listed on the National Register of Historic Places in 1975.

During the early 20th century much of the South Snake Range was placed under the jurisdiction of federal land management agencies as a means of protecting and conserving the area's resources. In 1909 Nevada National Forest was established, and a significant portion of the range, including the present park area, came under the administration of the recently established U.S. Forest Service in two land designations in 1909 and 1912. As part of its conservation ethic, the bureau favored a multiple-purpose resource utilization policy under which the land and its resources would serve a variety of regulated economic functions.

In 1922 Lehman Caves National Monument was established by presidential proclamation. Under Forest Service administration, the national monument received increasing visitation during the 1920s, resulting in the construction of new visitor facilities and overnight accommodations. Built in the late 1920s and named for Clarence and Beatrice Rhodes, who served as the Lehman Cave custodians during the 1920s and early 1930s, the Rhodes cabin is a representative example of such accommodations. Although it was moved from its original location and placed on a concrete foundation during the 1960s, the restored log cabin was listed on the National Register in 1975.

The national monument was administered by the Forest Service until 1933 when it was transferred to the National Park Service as part of a major reorganization of the federal government's executive department. The movement to enlarge the national monument and change its designation to national park status, first initiated in 1924, finally achieved success on October 17, 1986, with the establishment of Great Basin National Park.

Existing
Sites and
Resources

To date 30 prehistoric and 26 historic sites have been identified and recorded within the boundaries of Great Basin National Park. The prehistoric sites include 16 artifact scatters, one lithic scatter, nine rock art sites, and four caves. In addition, more than 40 prehistoric isolated finds have been identified. The historic sites are related primarily to mining, ranching, and agricultural activities, but several illustrate mapping, logging, and tourist industry themes. Data on these sites and their cultural milieu may be found in four NPS studies:

Archeological Overview of Great Basin National Park, by Krista Deal, 1988

Archeological Survey and Site Assessment at Great Basin National Park, By Susan J. Wells, 1990

Archeological Survey of the Baker Guard Station, Baker, Nevada, by George A. Teague, 1990

Historic Resource Study, Great Basin National Park, by Harlan D. Unrau, 1990

Three historic sites in the park were entered on the National Register of Historic Places in 1975 as having local significance – the Lehman orchard, Lehman aqueduct, and Rhodes cabin. A fourth historic site, the Osceola (East) ditch, is recommended for nomination to the National

Register in the *Historic Resource Study*. A component of the ditch system, the Stella Lake rock dam, is recommended for National Register listing as part of the ditch nomination. All other known historic sites in the park were evaluated and determined not to meet National Register standards in terms of significance and integrity under criterion C.

Twenty-six of the prehistoric sites were determined to possess significance under criterion D of the National Register (potential to yield scientific information). In addition, 16 of the historic sites were determined to possess components of archeological significance under criterion D.

It is estimated that less than 2 percent of the park has been systematically surveyed to professional standards for cultural resources. Thus, a comprehensive parkwide inventory and survey of cultural resources is needed to evaluate their contextual significance and interpretive value. As further survey work is conducted in the park, it is anticipated that more sites will be identified.

Existing knowledge of ethnographic resources in the park is lacking because ethnographic surveys have not been undertaken. A comprehensive parkwide inventory and survey of ethnographic resources is needed to evaluate their significance and interpretive value.

VISITOR USE AND PARK FACILITIES

VISITOR ACTIVITIES

Most visitors enter the Great Basin region on US 6/50 and then travel south on Nevada Highway 487 to the park entrance road in Baker. An entrance sign near the US 6/50-Highway 487 junction directs visitors to the entrance. The park entrance road (Nevada Highway 488) provides access to the park's primary attractions and to the visitor center at Lehman Cave.

At the visitor center, which was formerly the main facility for Lehman Caves National Monument, visitors can plan trips and obtain information on other regional attractions. A small theater offers audiovisual programs about the Great Basin and Lehman Cave, and an exhibit area provides interpretation of some of the national park's major natural and cultural history themes. A natural history association outlet in the visitor center lobby offers a good list of publications on the park and region.

The visitor center is also the support facility for the Lehman Cave tour operation. The Park Service provides regularly scheduled guided tours of the cave as well as on-site interpretation of the cave and park. Guided tours, with a maximum of 30 people per tour, are scheduled at 1½-hour intervals and run from 8:00 a.m. to 5:00 p.m. each day. In the summer an additional candlelight tour is scheduled at 6:00 p.m. each day. A large portion of the total visitor population (about 74,000 in 1988) take the Lehman Cave tour.

People wishing to spend more time in the park are given directions to the major road-accessible features, which are principally in the more developed northern part of the park. These include the Wheeler Peak road and scenic pulloffs, the three campgrounds along the road, the short trail from the road to the Osceola ditch, and the trail system leading from the Wheeler Peak campground that provides access to the major Wheeler Peak attractions. The present levels of use along the road and at the Wheeler Peak campground exceed the capacity of most parking lots and pullouts.

Other activities include hiking and horseback riding in the central section of the park to such high-elevation backcountry features as Baker and Johnson lakes. Hiking trails are also available in the park's southern reaches, paralleling the stream valleys associated with Snake Creek and the North Fork of Big Wash. A major point of interest

near the park's southeastern boundary is Lexington Arch, reportedly the largest limestone arch on earth.

Campers can select from limited-service sites along Lehman Creek to more informal sites along Snake Creek and Strawberry Creek. The latter two areas are especially popular with White Pine County residents; some families have used the same campsites for decades. Backcountry camping and hiking – popular activities in the South Snake Range before the national park was established – continue to attract visitors.

Visitor use during the park's first full year of operation (1988) was approximately double the previous use at Lehman Caves National Monument (approximately 74,000 versus 35,000). In 1989 visitor use decreased by approximately 4 percent to 70,000. In 1990 it decreased again by approximately 8 percent to 65,000. Over at least the last three years, July has been the peak month for visitation, with approximately 14,000 to 16,000 recreational visits. In July, peak day visitation was approximately 850 recreational visits and average daily visitation was approximately 500. Overall use of Great Basin remains low when compared to most other national parks, and it is anticipated that the park's isolation from large population centers and interstate highways will keep visitation relatively low for the foreseeable future.

The following information was excerpted from the 1988 *Visitor Survey, Great Basin National Park* prepared by the National Park Service Cooperative Park Studies Unit and the Department of Forest Recreation Resources at Oregon State University.

VISITOR CHARACTERISTICS AND INTERESTS

Great Basin National Park's visitor population is generally composed of well-educated individuals who frequently visit national park system areas. They consider Great Basin to be a destination park and may spend several days there during a visit. They place a high value on the park's unspoiled environment but would like to see some improvements in facilities (more campsites, better restrooms, more access to potable water, and more garbage cans). They would also like better signing on park roads and trails.

At least two-thirds of the park's visitors fit the following profile:

- They are part of a family group containing two to four persons.
- They are between 30 and 60 years old.
- They have not visited the park before.
- They are from Utah, California, or Nevada.
- They stay in the park for one or more days.
- They have visited other national park system areas during the current year.
- They are employed in a professional or technical position.
- They have had some college training.
- They rate their Great Basin visits to be very good to perfect.

The survey indicates that park visitors value and use the services that are offered, especially orientation and information services and the Lehman Cave tours. They generally express strong desires for expanded interpretive opportunities involving a much broader range of natural and cultural history themes. Frequently mentioned themes include archeology and early man, geology/glaciers, flora and fauna, Great Basin geography, seasonal changes, bristlecone pine ecology, homesteading, and orienteering. Visitors are not interested in commercial tours or concessioner-operated horseback tours. The regular 1½-hour Lehman Cave tours are preferred over shorter or longer cave tours.

Items cited as deficient in the area of interpretation include directional signs on roads and trails, the number of orientation and interpretive exhibits, and park publications. Visitors want more and better maps - maps showing secondary roads and maps of backcountry trails and campsites. They also want more publications on different themes, including grazing history, the Lehman orchard, mining history, ranching, regional orientation, minimum impact camping, and the effects of elevation on plants and animals.

In summary, the survey suggests that visitors are generally very pleased with their experiences at Great Basin National Park but would like more attention focused on basic amenities. They want expanded park interpretation that encompasses the entire Great Basin physiographic region.

Most facilities in the park predate its establishment and were previously part of Lehman Caves National Monument or Humboldt National Forest.

EXISTING FACILITIES

Lehman Cave Developed Area

The Lehman Cave developed area includes the park visitor center and the cave tour facilities. The visitor center is immediately in front of the cave entrance. This 4,000-square-foot facility provides interpretive media, ticket sales and staging for cave tours, book sales, and space for most of the park's administrative functions. Food service and souvenir sales are available on a seasonal basis in the adjoining 1,000-square-foot concession facility. The visitor center has a 40-car parking lot with several recreational vehicle and bus parking spaces. Approximately 400 feet north of the visitor center are a large picnic area and restroom. The picnic area has approximately 25 individual sites.

The cave entrance and exit are excavated tunnels that contain heavy doors to ensure security and maintain a near-natural airflow within the cave. The separate entrance and exit allow one-way cave tours with a minimum of backtracking. The natural entrance to the cave is a near-vertical shaft that has been covered with a concrete structure to prevent people and animals from falling in and to secure the cave from unauthorized entry and vandalism. Inside, the cave is equipped with an electrical lighting system and a hardened surface that allows easy access.

The Rhodes cabin, a historic structure northeast of the Lehman Cave visitor center, is currently used to house exhibits dealing with the history of Lehman Caves National Monument.

Campgrounds

There are four developed campgrounds, several undeveloped and informal campsites, and one overflow campground in the park, all of which were previously on Forest Service land. The four developed campgrounds contain a total of 104 individual campsites. Three of the four campgrounds are in the lower Baker and Lehman Creek drainages close to Lehman Cave; the Wheeler Peak campground is at the base of Wheeler Peak. The campgrounds and campsites are described below.

The Upper Lehman Creek campground is just off the Wheeler Peak road adjacent to Lehman Creek, approximately 1 mile northwest of Lehman Cave. The campground has 24 RV and tent sites and includes treated potable water and vault toilets.

The Lower Lehman Creek campground is immediately below the Upper Lehman Creek campground and is also adjacent to Lehman Creek. It has 11 RV and tent sites, treated potable water, and vault toilets.

The Baker Creek campground is approximately 2 miles southwest of Lehman Cave near the end of the Baker Creek road. It has 32 RV and tent sites. The Park Service provides piped-in water, but the water is not chlorinated or otherwise treated so it is posted as unpotable and must be boiled before use. This campground also has vault toilets.

Located at the upper end of the Wheeler Peak road adjacent to upper Lehman Creek at approximately 10,000 feet in elevation, the Wheeler Peak campground provides high-elevation camping experiences that are unique in the region. The campground contains 37 sites that are suitable for small RVs and tents. Like Baker Creek campground, it has an unimproved water system that provides untreated unpotable water. The campground includes vault toilets.

The Gray Cliffs campground is along Baker Creek below the Baker Creek campground. It was never completed by the Forest Service and currently functions as an overflow campground on busy weekends when the other park campgrounds fill to capacity. The campground has three separate loops and graded vehicle parking spaces. Tent pads and other site developments are limited. There are no tables, fire grates, toilets, water system, or other fixtures. Because it is close to Baker Creek and the surrounding terrain is steep, much of the campground is in a flood hazard area. In addition, fuel loading in the surrounding mature pinyon forest is very high, raising additional safety concerns from wildfire.

There are eight informal campsites scattered along the Snake Creek road. These sites are minimally developed and were established by repeated public use. At the end of the Snake Creek road the Shoshone campground includes picnic tables and fire grates. It is often used by large groups and extended families.

Four campsites similar to those along Snake Creek have been established over time along the upper Strawberry Creek road.

Roads

The park entrance road extends about 5½ miles between the town of Baker and the Lehman Cave developed area. The road is maintained by the state of Nevada and designated as Nevada Highway 488 east of the park

boundary. From the boundary, the road is maintained by the National Park Service to its terminus at Lehman Cave. The length of the entrance road within the park boundary is about ¾ mile.

For about 2 miles east of the park, the entrance road passes through privately owned land that is subdivided into separate parcels, many of which are developed as private homes. East of the private land, the road crosses BLM-administered land until it nears the town of Baker, where it again passes through private property for about ¼ mile before intersecting with Nevada 487.

The 12-mile-long Wheeler Peak road provides paved access to the Wheeler Peak cirque and Wheeler Peak campground. From its beginning, where it intersects the park entrance road near the boundary, the road ascends over 3,500 feet to reach the cirque. The road is in fair condition but has no shoulders and very few turnouts or other places for visitors to stop and enjoy the scenery while driving the route. The travel surface is about 22 feet wide.

The Baker Creek road is a well-constructed 3-mile, two-lane gravel road that provides access to the Baker Creek campground and trailhead. This road intersects with the park entrance road approximately ¼ mile east of Lehman Cave and terminates at the Baker Creek trailhead. Because of the area's constant dryness and the fairly high level of traffic along the road, it is very dusty and vegetation along the shoulders is usually covered with a layer of dust.

The Snake Creek road, another gravel road, is about 8 miles long within the park boundary and provides access to Snake Creek valley and the informal campsites along Snake Creek. The road begins on BLM-administered land where it intersects with Nevada 487 approximately 5.3 miles to the south of Baker and ends at the Snake Creek trailhead near the center of the park. In its upper reaches, the road is rough and has minimal gravel surfacing, but regular grading keeps this road passable for passenger cars.

The Strawberry Creek road is a narrow, one-lane, dirt and gravel road that provides access into the Strawberry Creek drainage in the northeastern section of the park. This road is used by few visitors because of its rough condition and its isolation from other park facilities.

The Mount Washington road is a very narrow and steep four-wheel-drive road that was constructed by miners to provide vehicular access to claims around Mt. Washington.

and along the ridge to the south of the peak. It begins in Spring Valley, traverses BLM and Forest Service lands, and terminates near the summit of Mt. Washington approximately 3 miles after entering the park boundary. This road is in extremely rough and eroded condition and is impassable even by four-wheel-drive vehicles much of the year.

There are numerous other informal, unmaintained four-wheel-drive roads throughout the park, many of which have been closed to vehicle traffic since the park's establishment.

Trails	There are 56 miles of designated trails within the park. They are accessible from trailheads within the park or from Forest Service lands adjacent to the park. The trails traverse a variety of terrain and provide access to mountain peaks, alpine and subalpine meadows, subalpine lakes, canyons, and high mountain valleys. Approximately 41 miles of existing trails are in poor condition and require major reconstruction to provide for visitor use; 14 miles are in fair condition and require rehabilitation or minor reconstruction. A trail study in 1989 concluded that most of the trails in the park need to be reconstructed.
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Administrative Facilities	Most of the park's administrative facilities are consolidated in the northeastern corner in or near the Lehman Cave developed area. Headquarters and administrative offices are in a portion of the visitor center. Employee housing is just south of Lehman Cave. The housing area includes eight houses, two cabins, and four trailers (one leased) for employees and their families; additional seasonal housing is leased on a temporary basis near the town of Baker. The park's maintenance facility, which is also south of Lehman Cave next to the housing area, consists of two buildings, a fire cache, equipment parking, and a storage area. Near the maintenance area, two trailers have been set up for office space.
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Utilities	A surface water system from Cave Spring provides potable water to the administrative and visitor facilities in the Lehman Cave area. The spring is covered, and there are two 50,000-gallon storage tanks and a chlorinator associated with the system. Three other smaller water systems provide water to the campgrounds in Lehman Creek, Baker Creek, and the Wheeler Peak area. All of these water systems obtain the water from improved springs. Only the smaller system that serves the Upper and Lower Lehman Creek campgrounds provides chlorinated potable water. Water from the two unchlorinated systems requires boiling or other treatment before drinking.
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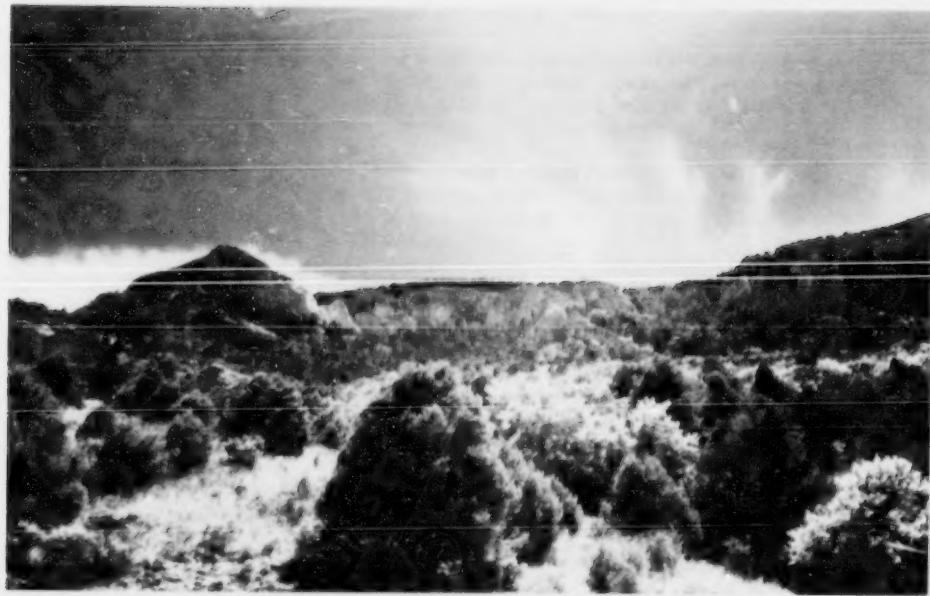
Sewage from the Lehman Cave developed area is treated biologically in a two-cell, lined series of lagoons below the developed area. Sewage from campgrounds is held in sealed vaults and periodically pumped and transported to the sewage lagoons for treatment.

Electrical power and phone service is provided to the Lehman Cave developed area by underground cables. A standby 93.5 kva diesel generator adjacent to the maintenance area provides power to the cave lighting system and administrative offices in the event of a power failure.

Most park housing is heated electrically, with wood burning stoves providing supplemental heat. One residence, the maintenance shop, and the visitor center are heated by oil furnaces, each with its own underground fuel storage tanks. The concession and all of the residence trailers are heated with propane.

The park radio system uses a repeater on Kings Top, about 35 miles east of the park in Millard County, Utah. This site provides excellent radio reception in the parallel valleys and canyons on the east side of the park.

A fire and intrusion alarm system is installed in the visitor center and concession area. The intrusion alarm also protects both cave entrances. Alarm reports are transmitted to the housing area.



ENVIRONMENTAL. CONSEQUENCES

IMPACT TOPICS

DERIVATION OF IMPACT TOPICS	To focus the evaluation of potential consequences of the proposed action and alternatives, specific impact topics were identified based on legislative requirements, resource knowledge and information, and concerns expressed by the public and other agencies during scoping (see the "Consultation and Coordination" section). The rationale for the selection of topics is discussed below by major category. The environmental consequences of the proposed action and alternatives are described by impact topic in the following sections.	Cultural resources were included as an impact topic because important archeological and historical sites were identified that could be affected by the proposed action and alternatives	Cultural Resources
Biological and Physical Resources	The following biological and physical resources and attributes were selected as impact topics because they were identified as exceptional during planning (see the "Planning Perspective" section for details): - bristlecone pine forests - riparian areas and water quality - alpine/subalpine areas - rare and sensitive plant species that are candidates for listing under the Endangered Species Act - peregrine falcons - Bonneville cutthroat trout - biological diversity - caves - air quality - vistas Floodplains and wetlands were also selected as a natural resource impact topic because of the ecological significance of these areas and the safety issues involved in attracting visitors to floodplain sites. Soils were selected because of the impacts that would occur from ground-disturbing construction activities.	Several user groups were identified as having the potential to be affected by the proposed action and alternatives:	Socioeconomic Environment
		livestock grazing permittees – the five permittees who are allowed to graze livestock on allotments within the park during the summer months	
		mineral interests – the owners of mining claims within the park and the owners of patented mining claims that border the park	
		private property owners – the owners of parcels of private property along the park's existing entrance road, near the park addition in the town of Baker, and along the boundary outside the park	
		regional economy – the businesses in and around the town of Baker and in the region	
		local visitors – local community residents who have traditionally used areas now in the park for recreation, in particular the camping sites along Snake and Strawberry Creek and in other park areas	
		other visitors – hikers, horseback riders, campers, sightseers, natural history observers, cave visitors, anglers, spelunkers, and other regional and national visitors	

**IMPACT TOPICS
DISMISSED
FROM FURTHER
CONSIDERATION**

**Other
Endangered
and Protected
Species**

Several endangered, protected, and candidate animal species identified in the "Planning Perspective" section are not known to be present or are only occasional transients in the park. These species – the bald eagle, Swainson's hawk, ferruginous hawk, and spotted bat – even if present in the park, would not be affected by the proposed action or alternatives and are not in need of any additional protection other than that generally afforded by a national park.

**Other
Vegetation
Types**

Other vegetation types identified in the "Affected Environment" section were not included as impact topics because they are widely distributed within the park, do not provide exceptional habitat, or will not be affected by the proposed action or any of the alternatives. These vegetation types, although not as rare or sensitive as those included as impact topics, are important to the overall health of the park ecosystem and would be managed accordingly.

The glacial features of the park are at the highest elevations and in the more remote areas along the crest of the South Snake Range. Because no development would occur at those elevations as a result of the proposed action or any of the alternatives, these resources were not considered as an impact topic.

**Glacial
Features**

PROPOSED ACTION

BIOLOGICAL AND PHYSICAL RESOURCES

Impacts on Bristlecone Pine Forests

Analysis. Many of the past impacts on the park's bristlecone pine stands would not be considered serious for other vegetation types (e.g., pinyon-juniper, ponderosa pine, aspen); however, because of the extremely long life span of bristlecone pines and the extremely slow rates of growth and recovery after damage, all impacts on bristlecones must be appraised from a longer term outlook.

Reconstruction and improvement of the trail system through the bristlecone pine stand in the Wheeler Peak semi-primitive day use subzone would provide additional definition to the trail tread, thereby protecting the pines from additional soil compaction and trampling caused by off-trail use and the lack of a continuous protective trail tread near their roots.

Closing the Mt. Washington road at the park boundary would provide increased protection for the ancient bristlecones in that area by eliminating public four-wheel-drive access to the Mt. Washington stand. This would reduce the direct impacts of vehicles on the roots and soils surrounding the trees as well as the possibility of vandalism or inadvertent physical damage to individual trees. This stand would be zoned as a research natural area and would be managed in accordance with the Park Service management policies to provide the greatest possible protection and allow only those recreational and other activities that would not detract from the area's research values.

Other bristlecone stands would also benefit from the proposed action. Most of them would be in areas zoned as protected natural areas, which would have positive indirect effects on the trees because these zones would be managed to perpetuate ecological values and minimize human intrusion.

Under the proposed action, domestic livestock grazing would be prohibited in the semi-primitive day use, protected natural area, and research natural area subzones. Although there is little available forage in any of the known bristlecone pine stands and livestock are relatively infrequent visitors to these stands, this action would provide additional protection by eliminating any random livestock activities that might directly affect the mature bristlecone pines or tree seedlings.

Conclusion. The proposed action would provide increased protection for the bristlecone pine stands in the park.

Cumulative Impacts. Within the national park system, there are only four other park areas that contain bristlecone pines (Bryce Canyon, Cedar Breaks, Death Valley, and Florissant Fossil Beds). None of these areas contain trees that are as old or as stressed as those in Great Basin National Park. Lands administered by the Forest Service in the southwestern states of Colorado, New Mexico, Nevada, Utah, Arizona, and California have numerous bristlecone pine stands. Many of these stands are very old and similar to those in Great Basin National Park. Most are not protected from access or from the long-term potential for vandalism or other physical impacts.

Although the proposed action would have a limited cumulative effect on bristlecone pines on a regionwide scale, it would have a positive cumulative impact on the bristlecone pine population in the national park system by ensuring protection of the most outstanding trees in the system. In addition, designating the Mt. Washington stand as a research natural area would permit additional baseline data to be gathered, thereby aiding understanding of the environmental requirements and life history of this species.

Analysis. During the 1988 grazing season, studies conducted by the Park Service indicated that the influence of domestic livestock grazing on the park's riparian areas was a factor in their undesirable condition. Under the proposed action, livestock grazing would continue to have adverse effects on riparian areas in the short term, primarily because of the reduction of vegetation along stream corridors but also as a result of soil compaction and erosion from trampling, the introduction of nonnative plant species, and the alteration of natural species composition in plant communities.

Water quality in the streams in riparian areas would also continue to be adversely affected through physical/chemical modification caused directly or indirectly by the presence of livestock. Research by Tiedemann (1988) demonstrated a direct relationship between the intensity of grazing in riparian areas and bacterial water quality. In that study, state of Oregon water quality parameters for bacteria were exceeded during the summer on the most intensively grazed watersheds with meadow ecosystems. Sediment, turbidity, and water temperature can also be adversely affected by grazing in riparian areas.

Impacts on Riparian Areas and Water Quality

PROPOSED ACTION

When the rangeland analysis and allotment management plans were completed and methods were devised for effectively managing grazing livestock in riparian areas, conditions in these areas should improve. However, because of the large amount of forage in riparian areas and the strong preference of livestock for these areas, as long as livestock continued to graze in the park, it is unlikely that they would ever be completely eliminated from riparian areas.

The proposed action would remove the Lower Lehman Creek campground, which is in the riparian area of Lehman Creek, and the portion of the Gray Cliffs campground that is in the riparian area of Baker Creek. Removal of a total of 51 campsites along about 600 linear feet of Baker Creek and 200 linear feet of Lehman Creek would eliminate direct and indirect human impacts on approximately 2 acres of riparian lands.

The new eastern extension of Wheeler Peak Scenic Drive would cross the riparian portion of Baker Creek just east of the proposed eastern park boundary. Where the road crossed the creek, construction would destroy approximately $\frac{1}{2}$ acre of riparian vegetation and habitat. The proposed new spur road from Wheeler Peak Scenic Drive to the new Lehman Cave parking area would cross Lehman Creek about $\frac{3}{4}$ of a mile inside the park boundary. Because Lehman Creek is quite narrow in this area (less than 30 feet across) and the banks on either side are fairly high, less than $\frac{1}{10}$ of an acre of riparian vegetation and habitat would be destroyed.

The proposed action would have no adverse effects on the wild and scenic river values of the South Fork of Big Wash.

Conclusion. Domestic livestock grazing would continue to be the major man-caused adverse effect on riparian vegetation and habitat. Future conditions in riparian areas should improve as a result of methods employed to manage livestock in these areas. However, as long as domestic livestock grazing continued, riparian areas would be adversely affected by vegetation reduction, soil compaction, introduction of nonnative species, changing or sustained unnatural species composition, and water quality degradation from fecal contamination, erosion, and siltation. Approximately $\frac{1}{2}$ acre of riparian habitat would be removed under the proposed action, and 2 acres of currently disturbed riparian lands would be restored.

Cumulative impacts. Riparian areas are numerous and extensive in the western United States and the Great Basin.

Areas within the park represent only a small proportion of those found locally and regionally. Most of the riparian areas in the western states have been adversely affected by domestic livestock grazing. For example, in 1980 the General Accounting Office reported on four resource areas in two Bureau of Land Management districts in Nevada using information they provided for evaluating riparian conditions. District evaluations indicated that 93, 86, 86, and 68 percent of the riparian habitat in the four resource areas were in poor to fair condition. Because of the apparent damage in many of the riparian areas in the region, any improvement in riparian habitat in the park would have a positive cumulative impact on riparian areas on a local and regional scale.

Analysis. The proposed action recommends no development in alpine and subalpine areas other than limited trail and backcountry campsite improvements. All vehicular access to these areas would be eliminated, and existing access roads and routes would be rehabilitated. These actions would have positive effects on the appearance and ecological conditions in alpine and subalpine landscapes.

The known rare and sensitive alpine and subalpine plant species that are candidates for listing under the Endangered Species Act are generally in areas with very sparse vegetation. Although little is known or documented about the effects of livestock grazing on these areas and the rare and sensitive plant species they support, the additional protection afforded by the proposed action (zoning areas above 10,500 feet as protected natural areas, thereby eliminating grazing) would benefit these species and the communities in which they grow.

Conclusion. Limiting development in alpine and subalpine areas, eliminating vehicular access, and zoning the areas to prohibit grazing would afford additional protection to these communities.

Cumulative impacts. There are few other mountain ranges in the region with large areas of alpine and subalpine vegetation. Because of this, actions taken to protect the alpine and subalpine communities within the park would have a substantial positive cumulative effect on a regional scale.

Analysis. Three potential sources of impacts on rare and sensitive plant species in the park have been identified - domestic livestock grazing, mining, and recreational activities. These sources are addressed separately.

Impacts on
Alpine/
Subalpine
Areas

Impacts on
Rare and
Sensitive
Plant
Species

Impacts from Domestic Livestock Grazing – The majority of the rare and sensitive plant species inhabit areas above 10,500 feet in elevation in alpine and subalpine communities. Under the proposed management zoning scheme most of these communities would be designated as part of the protected natural area subzone, where domestic livestock grazing would be prohibited. Some individual animals might stray into this subzone and trespass grazing might occur; however, zoning would provide substantially increased protection to plants.

Lower elevation rare and sensitive plant species would also receive increased protection under the proposed action. Methods would be instituted to separate grazing livestock from areas with rare and sensitive plants, and vegetation communities and rare and sensitive plant species would continue to be inventoried and mapped to provide data for management. These actions would aid the long-term preservation and recovery of these plants in lower elevations.

Impacts from Mining – Activities on existing mining claims in the park could have major effects on rare and sensitive plant species through direct excavation, creation of spoil areas, and machine operation and other activities around mines. Much of the habitat for these plants is in the area surrounding Mt. Washington, and approximately 5,000 acres in this area have existing mining claims. Before approving any claimant's plan of operations to allow mining to be initiated, the Park Service would evaluate the proposed mining area for the presence of rare and sensitive plants and would consider the results in its recommendation.

Impacts from Recreational Use – Most of the known rare and sensitive plant species occur in the alpine and subalpine communities far south of the popular attractions around Wheeler Peak and well removed from heavily trafficked areas. These species are also generally protected from human disturbance by their rocky cliff habitats.

Under the proposed action five backcountry trails would be built or upgraded in alpine and subalpine areas. Trail construction in these areas would remove less than 2 acres of potential habitat for rare and sensitive plant species. During trail planning and construction, the Park Service would identify and avoid all areas where such plants exist. Trail corridors would be less than 6 feet wide. Because visitors would tend to concentrate along trail corridors, the impacts on individual plants and their communities caused by random cross-country travel would be reduced by constructing or improving trails.

Ridges in the Mt. Washington vicinity also provide habitat for rare and sensitive plant species. Under the proposed action the Mt. Washington access road would be closed, thus reducing the potential for impacts on these species and their habitats from vehicle and pedestrian traffic. The inclusion of most rare and sensitive plant habitat in the protected natural area subzone would provide additional protection for the species.

Conclusion. Domestic livestock grazing, mining, and trail construction have the potential to disturb or destroy rare and sensitive plant species. Designating trail corridors, closing the Mt. Washington road, and including plant habitat in the protected natural area subzone would provide additional protection for these species.

Cumulative Impacts. Many of the rare and sensitive species in alpine and subalpine areas of the park are found in few other locations. The actions proposed in the plan would aid in perpetuating individual species and the integrity of their communities and would have a positive cumulative effect on a regional scale over time.

Analysis. Under the proposed action the Park Service, in cooperation with the Forest Service, the Peregrine Fund, and the Nevada Department of Wildlife, would actively work to reestablish the peregrine falcon in the South Snake Range and to maintain a core population of breeding birds in the park vicinity. No developments would be provided in or near the identified peregrine falcon recovery area on the west side of the park, and the Mt. Washington road would be closed, which would substantially reduce the possibility of humans disturbing nesting birds.

Conclusion. Park Service involvement in the peregrine recovery effort would help to reestablish this species in the park and surrounding region. The potential for disturbance of peregrine habitat in the Mt. Washington area would decrease with road closure.

Cumulative Impacts. The positive cumulative effects on migratory species such as peregrine falcons depend on consistent management nationwide. Recovery plans have been developed for many areas of the West, and reintroductions have been attempted in every western state. By supporting the reintroduction of peregrine falcons and reducing human intrusions in the recovery area, the proposed action would benefit peregrine falcon recovery on a national scale over time.

Impacts on
Peregrine
Falcons

PROPOSED ACTION

Impacts on Bonneville Cutthroat Trout

Analysis. The proposed action would provide additional protection for the existing population of Bonneville cutthroat in Pine and Ridge creeks in the northwest corner of the park and help perpetuate this important genetic resource. The drainages in these two creeks would be zoned as protected natural areas and would receive increased protection over and above that afforded riparian areas in general. Domestic livestock grazing would be prohibited in these areas. Sheep grazing in the past has affected these streams to some degree by reducing vegetation cover, eroding streambanks, and directly affecting water quality through fecal contamination and trampling. The proposed action would eliminate these adverse effects.

Reintroducing Bonneville cutthroat trout into waters on the east side of the park would expand their range and help protect the trout by establishing separate populations, thus lessening the probability of a single event such as a flood eliminating the trout from the South Snake Range.

At the present time it is not known what, if any, impacts recreational fishing may be having on the existing populations of Bonneville cutthroat trout. Because of the remote location of the existing west-side habitat, it is likely that the impacts from fishing are insignificant. The proposed action would seek to establish special fishing regulations to protect both the west-side population and any reestablished east-side populations. This would ensure that the impacts from future recreational fishing would be minimized.

Conclusion. The proposed action would enhance the integrity of existing trout habitat and would increase protection for the population as a whole by reintroducing trout on the east side of the park.

Cumulative impacts. Because of the scarceness of pure populations of Bonneville cutthroat trout on a regional scale, establishing additional populations within their historic range would have an important beneficial cumulative effect on their recovery and preservation.

Impacts on Biological Diversity

Analysis. Identified threats to the biological diversity of the park include invasion of native plant habitats by competitive nonnative species; disturbance and alteration of natural plant communities by domestic livestock grazing, mining, ground-disturbing developments, and human use; development of overly mature plant communities because of the suppression of natural fires; and climatic changes resulting from environmental factors. The proposed action would have only minor effects in reducing these threats

except for those associated with fire suppression. Some nonnative species are well established within the park, and it would not be feasible to eliminate many of them. In addition, continued livestock grazing would presumably introduce additional nonnative species into the park in future years. A rangeland rotation system would be established to help decrease the impacts of grazing on the park's biological diversity.

Mining would be controlled through the review and approval process for plans of operations. The plant and animal species that might be affected by any proposed mining activity would be investigated before approval. These investigations and the approval process would minimize but not eliminate potential impacts on biological diversity from mining.

Recreational use would not have a significant effect on biological diversity. Rare and sensitive plant communities would be avoided during trail and campsite planning and construction, and the dispersed use in trailless areas would not be of sufficient magnitude to affect these community types. If backcountry use increased to levels that could affect biological diversity, a permit system would be established.

The development of a fire management plan with prescriptions for allowing natural fires to burn within the park would help to ensure a heterogeneous natural landscape with diverse habitats.

Conclusion. There would be few effects on biological diversity as a result of the proposed action. Grazing would continue to affect natural vegetation diversity; however, management methods would be employed to encourage stock to graze in areas with less sensitive resources, thus reducing the present impacts of grazing in some areas. Prescriptions for allowing natural fires to burn would have a positive effect in ensuring natural biological diversity.

Cumulative impacts. There would be no cumulative impacts on biological diversity as a result of the proposed action.

Analysis. Under the proposed action several developments would be constructed on or near areas with the potential for underlying caves. These include the proposed Great Basin visitor center, short sections of the proposed Wheeler Peak Scenic Drive, the additional water storage structures near Cave Spring, and possibly the Lehman Flats campground (the proposed campground site is on alluvium of unknown

Impacts on Caves

depth that might overlie limestone substrate). Before constructing these facilities, the Park Service would perform seismic investigations to determine if caves were present in the underlying substrate and if so where. This information would be used to develop mitigating measures to eliminate the possibility of adversely affecting caves. If caves were determined to be near the surface and if it could not be assured that the proposed developments would not affect natural cave conditions, including percolation and subsurface water movements, developments would be planned and built elsewhere.

The Great Basin visitor center would be designed to minimally impact the land. Because of the presence of numerous caves in the substrate, the Park Service would conduct a geotechnical investigation to determine the bearing capacity of the substrate and to assure that construction would not impact unknown cave systems. Two possible types of construction include slab on grade or pole type. (The maximum depth of excavation needed for the grade beam would be 2 feet. The depth of excavation required to support pole-type structures could be greater than 2 feet.) Electrical and water system connections would involve extension of existing systems from the existing park housing area. These systems would be incorporated into conduit buried beneath existing and proposed roads to minimize additional damage. The footprint of the building would be kept to a minimum.

Several existing structures would be removed from areas with the potential for underlying caves, including most of the buildings in the employee housing area, four buildings and the boneyard in the maintenance area, the lower parking lot in front of the proposed Lehman Cave interpretive center, the existing park entrance road near Lehman Cave, and approximately three-fourths of the Grey Cliffs campground. Removal of these developments would restore natural water infiltration to these areas and eliminate the possibility of future maintenance or reconstruction activities adversely affecting caves.

No actions are proposed that would adversely affect Lehman Cave beyond present conditions.

Conclusion. The proposed action would involve limited construction on areas with the potential for underlying caves. A larger number of existing facilities would be removed from such areas. No adverse effects on cave resources are anticipated.

Cumulative Impacts. Caves are relatively common in the region. Many neighboring ranges contain caves. Therefore, on a regional or national scale the impacts of the proposed action would be minor.

More facilities in the park would be removed from than constructed on areas with the potential for underlying caves. This would slightly reduce the potential cumulative impacts on the park's cave resources in the future.

Analysis. No significant adverse impacts on air quality would result from implementation of the proposed action. Additional visitation and related automobile traffic could cause slight increases in automobile emissions on and near park roads. Dust levels are high at times because of high winds and arid conditions, particularly along the Baker Creek road. This road would be paved under the proposed action, but other unpaved roads (Snake Creek, Strawberry Creek, and Big Wash roads) would likely receive more traffic and experience temporary increases in dust when winds were high.

Building and utility construction would result in temporary localized increases in particulates. Machinery emissions and increased airborne dust from construction activities would decrease air quality in the vicinity of the project sites. Normal conditions would return when construction was completed.

Any prescribed burning in the park would result in temporary decreases in air quality. The Park Service would work with Nevada state agencies to minimize any adverse effects.

Conclusion. The impacts on the park's air quality would be minor.

Cumulative Impacts. The proposed action would have no measurable cumulative effects on regional air quality.

Analysis. Removing the maintenance area, sewage lagoons, and almost all housing from the prime resource area of the Baker and Lehman creek drainages would substantially improve views from vantage points on Wheeler Peak Scenic Drive, Wheeler Peak itself, and various trails on the east side of the South Snake Range in the park. Visitors would no longer have to look down on these intrusive developments.

Removing the lower parking lot and restricting use of the upper lot in front of the Lehman Cave interpretive center would substantially improve views of the portion of the

Impacts
on Air
Quality

Impacts
on Views

PROPOSED ACTION

northern Snake Valley that is visible from the front porch of the interpretive center. Visitors would no longer have to look over vehicles and a constant flow of traffic to view the valley below. The proposed new parking area north of Lehman Cave would be visible from several vantage points in the park; however, the parking area would be designed and laid out to use the surrounding pinyon forest to help screen and mitigate its impact on park vistas.

The large east-facing viewing deck at the new Baker Ridge visitor center would provide opportunities to view and experience a dramatic Great Basin scene, which would greatly enhance the story presentation in the visitor center film and exhibits. The visitor center itself would be visible from several vantage points, but it would be designed and sited to minimize its impact on park vistas. The impact of the building on these vistas would be offset by the benefits derived from effectively conveying the Great Basin story to large numbers of visitors in a setting that complements the story presentation.

The proposed eastern extension of Wheeler Peak Scenic Drive would be designed and constructed based on the results of the computer-generated analysis (see appendix E) to minimize its resource impacts and its impacts on views from the new visitor center. Terrain and vegetation would be used to block or screen views of vehicular traffic from the visitor center. In the foreground (0 to 3 miles), vehicles would only be seen in two locations – for a short distance (about 100 yards) approximately 2 miles below the visitor center, and as they crossed Baker Creek (again, about 100 yards) approximately 1.5 miles downslope. Native vegetation would be used to screen the approach and the low-profile bridge at Baker Creek to reduce the visual impact. Visitors might be able to see vehicles turning off Highway 487 at the entrance to the scenic drive about 5 miles away from the visitor center; however, the effects on views would be negligible at this distance. The interpretive experiences associated with the new extension of Wheeler Peak Scenic Drive would offset the impacts of the road views from the visitor center.

Snake Valley and Spring Valley play extremely important roles in the Great Basin visitor experience. A large part of this experience is the unobstructed views across these two vast valley basins looking toward the park from the regional exhibit shelters and toward the basins from within the park. The proposal to promote preservation of the visual integrity of these two basins through NPS review and recommendations concerning development in the region would be

a small step in protecting these vital visual extensions of the park. However, because such actions have had limited success in controlling, modifying, or stopping land use decisions that are detrimental to the visual integrity of landscapes, there would still be a high probability that these valleys could be adversely affected by major development actions in the future.

Conclusion. The removal of most of the NPS operational development from the park would greatly enhance views from various vantage points within the park. The interpretive benefits of the eastern extension of Wheeler Peak Scenic Drive and the Great Basin visitor center and viewing deck would outweigh the impacts that these two developments would have on park vistas. Even with NPS actions to ensure preservation of visual integrity of the Spring Valley and Snake Valley basins, views across these basins would likely be compromised over time because of incompatible developments and land uses.

Cumulative impacts. There would be no cumulative impacts on vistas as a result of the proposed action.

The Park Service has developed final procedures for implementing Executive Orders 11988, "Floodplain Management," and 11990, "Protection of Wetlands" (45 FR 35916 as amended on August, 1982 by 47 FR 36718), and these procedures were followed in this planning effort. Alternatives were developed that would avoid or mitigate the adverse impacts associated with all new development in floodplains and wetlands.

Analysis. No floodplains have been mapped along the streams in Great Basin National Park. Because all of the streams are high-gradient streams of relatively small size, it was assumed by the planning team that 100- and 500-year floodplains do not extend far beyond the riparian areas associated with the streams. Most of the wetlands in the park are associated with streams, springs, and seeps. Development in these areas was avoided to the extent possible.

Existing park developments and facilities would have only minor impacts on the apparent floodplains of Baker, Lehman, and Snake creeks. None of the existing permanent park structures are in apparent floodplains, but portions of all developed campgrounds are within the apparent floodplains of Baker or Lehman creeks. Because of the relatively small size of these streams and their drainage areas and the presence of adequate escape routes, flooding was not

Impacts on
Floodplains
and
Wetlands

considered a significant hazard to human life or property. In addition, flooding events are unlikely to be so unexpected, violent, or devastating that human lives would be placed in immediate or grave danger. The only site within an apparent floodplain that might cause safety hazards is a portion of the Grey Cliffs campground, from which rapid evacuation would be difficult because of the steep terrain on one side.

The proposed action would remove the entire Lower Lehman Creek campground and the portion of the Grey Cliffs campground that presents safety hazards. The Lower Lehman Creek campground would be removed because the high water table during the spring season causes wet and muddy conditions in some of the campsites. Approximately three-fourths of the Grey Cliffs campground across Baker Creek from the Baker Creek road would be removed to eliminate hazards from possible flash floods. A new campground would be built at Lehman Flats to replace the sites removed from the Lower Lehman Creek and Grey Cliffs campgrounds and to provide some additional campsites. The site of the new campground would be well above Lehman Creek and out of its apparent floodplain.

The proposed eastern extension of Wheeler Peak Scenic Drive would cross the apparent floodplain and riverine wetlands of Baker Creek outside the park boundary on land administered by the Bureau of Land Management. The proposed road alignment would minimize the effects on the floodplain and streamside wetlands. The road would cross the creek at a 90 degree angle and would not parallel the creek on either side of the crossing. Because the wetlands are in a narrow corridor, the bridge would be of sufficient span to prevent any fill material from altering the wetlands or affecting the water flows on which they depend. The proposed spur road from Wheeler Peak Scenic Drive to the new Lehman Cave parking area would cross the floodplain of Lehman Creek and its streamside wetlands. Because the creek is quite narrow in this area and the banks are fairly high, it should be possible to build the road and bridge entirely outside the creek's apparent floodplain, with very little damage to associated wetlands.

The most significant effect on wetlands would result from management of grazing in riparian areas and the wetlands associated with them. When the grazing management plan was completed and methods were instituted managing livestock in these areas, conditions in riverine wetlands should greatly improve. However, as long as livestock continued to graze in the park, it is unlikely that they would ever be completely eliminated from wetlands.

Conclusion. The proposed action would have generally beneficial effects on wetlands and would remove the creekside campgrounds with the highest risk for human life and safety from flooding. The proposed Wheeler Peak Scenic Drive would be designed and built to minimize its effect on the wetlands and floodplain of Baker Creek, but it would cross the creek and its floodplain in one location outside the park boundary. Domestic livestock grazing would continue to adversely affect the park's wetlands, but to a lesser extent than at present.

Cumulative Impacts. There would be no cumulative impacts on wetlands or floodplains as a result of the proposed action.

Analysis. The proposed developments would cause approximately 124 acres of soil disturbance. Of this total, approximately 45 acres (36 percent) would be on land administered by the Bureau of Land Management, 8 acres (7 percent) on land administered by the U.S. Forest Service, and 71 acres (57 percent) on land within the park or on the Baker administrative site. Most of the soil disturbance would result from construction of roads and parking lots, with lesser amounts resulting from construction or rehabilitation of buildings, trails, campgrounds, sewage treatment facilities, and other developments. Wherever possible, new roads, trails, and other developments would be placed in previously disturbed areas or corridors. Therefore, many of the soils that would be affected have already been disturbed by past trail or primitive road construction, four-wheel drive vehicle use, or other human-caused activities. An estimated 27 acres of previously disturbed soils would be rehabilitated and revegetated.

Impacts
on Soils

Approximately 59 percent of new soil disturbance would be in the shadscale-desert shrub vegetation type, with lesser amounts in pinyon-juniper (24 percent), mixed conifer (10 percent), aspen (7 percent), and mountain mahogany (less than 1 percent) types.

The grazing management actions under the proposed action would result in less potential for soil erosion in areas above 10,500 feet elevation and in riparian areas. Proposals to minimize grazing impacts in riparian areas might result in increased soil impacts elsewhere. For example, relocating cattle from streamsides to hillsides would result in decreased soil erosion in riparian areas and a corresponding increase in soil erosion on hillsides.

Conclusion. Approximately 124 acres of soils would be disturbed by developments under the proposed action, and

PROPOSED ACTION

approximately 27 acres of previously disturbed soils would be rehabilitated and revegetated. Thus, there would be a net impact on 97 acres of soils. Most of this impact would be outside the park boundary and would be associated with proposed roads or structures on BLM land or on the Baker administrative site. Grazing would continue to contribute to soil erosion, but actions would be taken minimize soil erosion above 10,500 feet elevation and in riparian areas.

Cumulative Impacts. Over time, domestic livestock grazing would continue to cause some soil erosion. To a lesser degree, recreational activities such as hiking and horseback riding, which would likely increase under the proposed action, would also cause minor amounts of soil erosion along trail corridors.

CULTURAL RESOURCES

The proposed action would establish a more systematic and comprehensive program for the preservation, protection, and interpretation of cultural resources in Great Basin National Park. It would provide for the preservation of cultural resources illustrating the history of the area and for additional efforts directed at management of the park's cultural resources.

All actions would comply with section 106 of the 1966 National Historic Preservation Act as amended (16 USC 470 et seq.) and its implementing federal regulations. Compliance would be in accordance with the programmatic memorandum of agreement between the Advisory Council on Historic Preservation, the National Conference of State Historic Preservation Officers, and the Park Service.

Impacts on Archeological Resources

Analysis. Little is known about the archeological resources in the park, and a comprehensive parkwide inventory and survey of sites is proposed to evaluate their contextual significance and interpretive value.

Where possible, areas with known concentrations of archeological resources would be avoided as construction and development sites. Two exceptions would be the proposed developments in archeological zones at the Baker guard station and Lehman Flats. All four of the significant archeological sites at the Baker guard station have the potential for subsurface deposits; nine of the 11 significant archeological sites at Lehman Flats have similar potential. Proposed development at the guard station would virtually destroy the sites there, but the Lehman Flats campground could be designed and laid out to avoid many of the sites. The proposed spur road to the Lehman Cave parking area would be in an area of archeological significance, but this

road could also be aligned to avoid areas of significance. Before earth-disturbing activities commenced, archeological testing would be conducted to determine the nature and extent of the archeological resources to be affected. Testing would be carried out in consultation with the state historic preservation officer in order to avoid or minimize effects or, failing that, to mitigate effects.

Other proposed developments, including the park boundary fence, Mt. Moriah overlook, Osceola ditch interpretive trail, and Great Basin visitor center on Baker Ridge, would not disturb any known significant archeological sites or resources.

Public use of such facilities as campgrounds, picnic areas, trails, and interpretive sites would affect nearby archeological resources. Easily accessible resources would be vulnerable to surface disturbance, vandalism, or theft. New trails could increase the likelihood of archeological sites being disturbed, and resources would be vulnerable to inadvertent or deliberate destruction. Vandalism and inadvertent damage to known archeological resources would be partially mitigated by initiating on-site patrols, monitoring to detect vandalism, illegal collection, and other deterioration, and educating visitors about the value of these resources and the importance of protecting them.

Conclusion. Proposals would generally upgrade the identification, evaluation, preservation, protection, and interpretation of important archeological resources throughout the park.

Cumulative Impacts. Although the proposed action would result in some adverse impacts on archeological zones in the park, the cumulative impacts on a regional scale would be minimal.

Analysis. Preservation/stabilization and interpretation of the three sites listed on the National Register of Historic Places as having local significance (the Lehman orchard, Lehman aqueduct, and Rhodes cabin) and the one site recommended for listing (the Osceola ditch) would ensure their long-term protection for public enjoyment. All on-site media and devices to interpret these resources would be designed and placed to avoid impacts and minimize the visual intrusion on the historic scene. The Johnson mill and mine would be evaluated under National Register criteria, and appropriate treatment would be specified based on the eligibility determination. Additional properties meeting National Register criteria would be nominated. Other sites would be left as is, and surface and subsurface remains

Impacts on Historic Resources

would be allowed to deteriorate naturally, consistent with visitor safety requirements and the provisions of federal historic preservation laws and NPS management policies.

Some historic sites pose potential dangers to visitors. Possible actions to reduce or eliminate such dangers might include closing and sealing mine shafts, adits, tunnels, stopes, and test pits, removing hazardous structures and nonhistoric debris and scatter, returning sites to natural conditions, and removing artifacts. Safety priorities would be based on the degree of hazard and visitor accessibility. Consultation with the state historic preservation officer would be conducted for historic sites with archeological elements that meet the National Register criteria or are determined eligible for the register.

The recording of cultural sites and the collection of interpretive artifacts would result in the accumulation of data on the history of the park area. Systematic management of the museum collection would benefit the curation of individual items and the preservation of archeological and historical resources.

Conclusion. Proposals would improve the preservation, protection, and interpretation of significant historic resources in the park.

Cumulative Impacts. There would be no cumulative effects on historic resources as a result of the proposed action.

SOCIOECONOMIC ENVIRONMENT

Impacts on Livestock Grazing Permittees

Analysis. Five individual permittees graze livestock in Great Basin National Park. As required by the park's enabling legislation, the Park Service would continue to allow grazing to the same extent as was permitted in July 1985 and would take no actions to restrict grazing except to further sound rangeland management practices.

The proposed action would have moderate effects on grazing permittees, primarily by requiring them to keep tighter control on the movements of their stock and limiting the areas that stock could use for forage. Some of the campgrounds and visitor use areas would be fenced, but it is unlikely that all sensitive areas (riparian areas, subalpine meadows, and areas above 10,500 feet) would be fenced or otherwise barricaded to keep domestic stock out. This would place a greater burden on permittees to ensure that grazing livestock did not enter these areas.

Conclusion. Current grazing permittees would be assured the continued availability of the grazing allotments in the

park. However, they would be required to restrict grazing livestock to certain locations to a greater extent than in the past.

Cumulative Impacts. In recent years, most federal agencies administering public lands have increased requirements and placed additional restrictions on domestic livestock grazing on those lands. In general, grazing restrictions require permittees to move stock more frequently, to keep stock out of certain areas, and to remove stock from areas before the available forage is depleted. The restrictions that would be placed on grazing permittees within the park under the proposed action would add to this cumulative impact.

Analysis. There are 247 mining claims in the park. All of these claims are unpatented, and most are within five claim groups in the Mt. Washington area. In addition, there are nine patented claims on lands adjacent to the park boundary in the Mt. Washington vicinity.

Impacts on Mineral Interests

The precise impacts on mineral interests within the park are difficult to assess because the Park Service has incomplete information on the mineral values and validity of these claims. In addition, it is impossible to predict the future value of the minerals on the claims. The initial field reconnaissance and validity work that the Park Service has conducted in the last three years indicates that there is only low to moderate potential for mineral development. Because there has been no mining activity in the area for many years, the economic impacts on mineral interests as a result of the proposed action would likely be minimal in the foreseeable future.

Because all of the mining claims within the park are unpatented, the only surface rights that the claimants are entitled to are those incidental to mining. The Park Service has the authority to approve and regulate all surface activities. To initiate any work related to mining, the claimant would have to submit a plan of operations for review and approval by the park superintendent. Before any such plans were approved, the Park Service would conduct validity examinations on all claims. This would have two major effects on the claimants. First, there would be a delay in review and approval of any plan of operations that was submitted. This delay could be as long as one to two years, because the field work would have to be scheduled for the next available field season and the report would require several months to prepare. Second, if it was determined that a claim was invalid, the Bureau of Land Management would

PROPOSED ACTION

initiate procedures to extinguish it. The decision to extinguish a claim would be subject to appeal.

Mining operations cannot be denied without compensation on a valid mining claim with an approvable plan of operations. If a claim was determined to be valid, the Park Service would have to decide whether to allow operations under an approved plan or to purchase the claim at fair market value. For most claims, especially those in the area surrounding Mt. Washington, the decision would be to purchase. NPS purchase of mining claims would eliminate the possibility of future mining and mineral exploration in those areas.

Owners of patented or valid unpatented mining claims outside the boundary who required access across park lands to mine their claims would also have to submit plans of operations for approval by the Park Service. If the Park Service decided not to approve a plan for a patented mining claim, it would have to purchase the property at its appraised value.

Conclusion. The owners of mining claims within the park could be substantially affected if their claims were determined to be valid and they wished to mine; however, the Park Service would be required to purchase any valid claims on which it denied approval of the plans of operations. It is probable that the vast majority of these claims are invalid and would never be mined. Therefore, the economic impacts on mineral interests would be minimal for the foreseeable future.

Cumulative Impacts. Mining is major segment of Nevada's economy, contributing over \$240 million dollars in income each year to residents of the state. In White Pine County, mining provides approximately \$18 million to its residents' income (U.S. Department of Commerce, 1986 data). None of this reported income is from mining operations occurring within the park. The number of mining claims within the park and the amounts of minerals located within them represent very minor amounts of acreage and known mineral deposits when judged on a local (county) or regional (state) scale. As a result, unless there is a major unknown mineral deposit located within the park, the cumulative impacts of this proposal on mineral interests would be negligible.

Impacts on Residents and Private Property Owners

Analysis. The 15 to 20 private homeowners along the existing entrance road (Nevada Highway 488) would benefit from the increased privacy afforded by relocating visitor traffic to the new Wheeler Peak Scenic Drive. After the scenic drive was opened, traffic volumes along the existing

entrance road would decrease dramatically, reducing noise levels and improving safety for residents.

Relocating the park entrance about 2 miles south of the existing entrance on Nevada Highway 487 would not adversely affect commercial interests in Baker. The majority of visitors would still arrive from the north and drive through town to reach the park; however, instead of turning onto the park entrance road in the middle of town, they would pass through the entire town.

The approximately 10 homeowners who live just south of Baker adjacent to Highway 487 would notice substantial increases in traffic volumes and noise levels when the scenic drive was opened. The potential for traffic accidents along this portion of the highway would also increase.

Because of overall increases in park visitation, Baker residents and property owners would come into contact with visitors more frequently. Some might view increased visitation as an economic benefit; others might view it as an intrusion or an invasion of privacy.

Baker residents would have a longer travel distance to the park boundary as a result of the proposed action. Most residents can now reach the park boundary in 10 minutes or less. The proposed action would increase their travel time by another 10 to 20 minutes, depending on their originating point.

The construction of park facilities and the development of a water and sewer system in and near the town of Baker would, to some degree, change the character of the town. The volume of maintenance-related and administrative traffic would increase. Most of this increase would be to the north of the town center, occurring between the Baker administrative site and the present entrance road (Nevada 488). Commercial opportunities along the existing entrance road would decrease, but such opportunities would increase between the town of Baker and the new park entrance road. The construction of park housing at the Baker administrative site would bring more neighbors into the Baker community and increase its size. If the residents of Baker chose to jointly develop a water and sewer system with the Park Service, it would be much less likely that residents' domestic water would be contaminated by neighboring septic systems. It is also likely that there would be direct economic benefits to some of the residents because of jobs created for the construction and maintenance of the Baker administrative site and the sewer and water system.

Owners of property adjacent to the park boundary and close to exceptional resources within the park could expect concern from the Park Service and the public about any development, activity, or proposed activity that threatened resource values. In such an event, the Park Service would work with the property owner and local, county, and state governments to ensure protection of resource values.

Conclusion. The majority of residents and landowners in the Baker vicinity would benefit from the proposed Wheeler Peak Scenic Drive. The reduction in traffic volumes and noise levels along the existing entrance road would improve the quality of life for residents along that road. In addition, the new park entrance would route most visitors all the way through the commercial center of Baker. Overall, residents and landowners would have more frequent contacts with visitors. Some landowners with properties adjacent to exceptional resources in the park might be prevented from constructing certain types of developments on their land because of Park Service efforts to protect those resources.

Cumulative Impacts. There would be no cumulative impacts on residents and private landowners as a result of the proposed action.

**Impacts on
the
Regional
Economy**

Analysis. In looking at the potential economic impacts of Great Basin National Park on the surrounding region, three types of expenditures were considered – expenditures from construction projects in the park, expenditures from the park's operating budget, and visitor expenditures. With the help of an independent contractor, the Park Service used the Forest Service's IMPLAN model to analyze potential economic growth in the Great Basin region as a result of these expenditures. The analysis was conducted for Beaver and Millard counties in Utah and Lincoln and White Pine counties in Nevada. The results describe potential economic growth in terms of total dollars of business activity in the region (total economic impact), number of full-time jobs created, and total value added to the region. Total value added provides a tangible measure of regional benefits in personal income (wages, salaries, profit, interest, rent) and business sales taxes. All economic figures are expressed in 1990 dollars.

TABLE 12: SUMMARY OF IMPACTS ON THE REGIONAL ECONOMY – PROPOSED ACTION

Construction Expenditures (1990 dollars)

	Total Costs (\$MM)	Total Business Activity (\$MM)	Personal Income and Business Taxes (\$MM)	Total Jobs (FTE)
Pre-Park	0	0	0	0
Existing	0	0	0	0
Future				
Region	29.3	54.5	23.2	591
Nonregion	29.3	36.5	15.0	357

Operating Budget Expenditures (1990 dollars)

	Total Budget (\$000)	Regional Purchases (\$000)	Total Business Activity (\$000)	Personal Income and Business Taxes (\$000)	Total Jobs (FTE)
Pre-Park	256	170	302	230	10
Existing	1,310	874	1,487	1,124	46
Future	2,027	1,359	2,317	1,793	75

Visitor Expenditures (1990 dollars)

	Total Expenditures (\$000)	Total Business Activity (\$000)	Personal Income and Business Taxes (\$000)	Total Jobs (FTE)
Pre-Park	746	1,028	497	25
Existing	1,513	2,099	1,013	51
Future				
Stable	1,604	2,224	1,074	54
Enhanced	3,208	4,448	2,148	108

PROPOSED ACTION

Construction – The proposed action would generate an estimated \$29,300,000 (net) in construction activity. The magnitude of regional economic benefits would depend on how many projects were awarded to firms in the region, what proportion of needed construction supplies and materials was purchased from businesses in the region, and what proportion of the work force constituted regional residents. For evaluation purposes, two scenarios have been evaluated in this DEIS. The first scenario assumes that all projects would be awarded to firms in the region; the second assumes that all projects would be awarded to firms outside the region.

All construction-related economic benefits would be of a temporary nature and would not result in permanent jobs or long-term growth in the regional economy. The figures here represent the total impact from all construction projects and would be spread over the duration of construction activities. Under the in-region scenario, the total business activity would increase by \$54,500,000; this increased activity would result in the equivalent of 591 full-time jobs and an increase of \$23,200,000 in personal income and sales taxes. Under the out-of-region scenario, there would be an increase of \$36,500,000 in total economic output, resulting in the equivalent of 357 full-time jobs and an additional \$15,000,000 in personal income and sales taxes. Actual short-term economic benefits from construction under the proposed action likely would fall somewhere between the two scenarios.

Operating Budget – A more significant long-term influence on the regional economy would result from park operational expenditures. Such expenditures (e.g., payroll, utilities, business services, supplies) would provide annual, recurring benefits to the economy. The extent of those benefits would depend on how much money went to firms or individuals in the region. In 1986, before the area's designation as a national park, the operating budget was \$256,000. This level of spending included \$170,000 in regional expenditures, resulting in \$302,000 in total business activity, an equivalent of 10 full-time jobs, and \$230,000 in personal income and sales taxes. A review the park's 1989 operating budget (\$1,310,000) indicates that about two-thirds (\$874,000) were regional expenditures. These expenditures resulted in an increase of \$1,185,000 in business activity creating the equivalent of 36 additional full-time jobs and \$894,000 in personal income and sales taxes.

The proposed action would result in an additional \$717,000 in annual NPS operating expenditures. This would increase

regional expenditures by \$485,000 and the total annual business activity by \$830,000. An additional 29 full-time equivalent jobs and \$669,000 in personal income and sales taxes would be created.

Visitor Expenditures – Regional economic benefits would also be realized from annual expenditures by nonresident park visitors. Two factors would influence the extent of this impact: the number of nonresident visitors drawn to the area by the park itself or by the park as part of a group of regional attractions, and the extent and type of services available.

A 1988 survey of visitors to Great Basin indicated that the average length of visit was one day, the average party size was 4.1 persons, and the average per-party expenditure was \$85. Based on these data, the 73,600 visits recorded in 1988 resulted in visitor expenditures of \$1,513,000. Although the percentage of nonresident visitors could not be determined from the survey information, for the purposes of this analysis it is assumed that the majority lived outside the region. This level of spending generated a total of \$2,099,000 in business activity, creating the equivalent of 51 full-time jobs and \$1,013,000 in personal income and business taxes. In 1985, before Great Basin's designation as a national park, 36,300 visits were recorded at Lehman Caves National Monument. This level of visitation resulted in expenditures of \$746,000, generating \$1,028,000 in total business activity, \$497,000 in personal income and taxes, and 25 full-time equivalent jobs.

Under the proposed action, visitor use of the park is expected to stabilize at about 78,000 visits per year. This level of visitation would increase visitor spending by \$91,000, resulting in an additional \$125,000 in total regional business activity, the equivalent of 3 full-time jobs, and \$61,000 in personal income and business taxes. If the private sector marketed the park as a unique recreational opportunity and expanded visitor services outside the park to capture more visitor clientele, the length of stay and per-party expenditures would likely increase in the area. For the purposes of this analysis, it is reasonable to assume that such activities could double the average length of stay and/or expenditures with a resulting increase in visitor spending by an additional \$1,695,000. This level of visitor spending would generate \$2,349,000 for regional businesses, 57 full-time equivalent jobs, and \$1,135,000 in personal income and business taxes.

Summary – Although some benefits would accrue to the region as a result of park-related expenditures, the overall

impact of the park on the regional economy would be small and has for the most part already been realized. In terms of employment, for example, the Great Basin operating budget since the park was established has already added the equivalent of 36 full-time jobs to the region's economy; the proposed action would create an additional 29 full-time equivalent jobs. Since park establishment, increased visitor expenditures have added another 26 full-time equivalent jobs, and an additional 3 full-time equivalent jobs would be created through visitor expenditures under the proposed action. However, local businesses have not yet fully capitalized on the economic potential of the park. If through increased private sector marketing and visitor services, local businesses could stimulate increased visitor expenditures in the area, 57 full-time equivalent jobs would be created. Construction activities could create an additional 357 to 591 temporary full-time equivalent jobs. However, these increases are minimal when compared with what would happen during a "boom" period for the area's economy. When the power-generating plant was being constructed outside of Delta, for example, over 2,000 temporary jobs were created. Nevertheless, in an economy with a static employment base of around 10,000 jobs, 85 to 95 new jobs is an important economic benefit. The total economic output resulting from the proposed action would also be minimal. Spread over the population of the region, the dollar increases attributed to the proposed action would have a minor impact on the regional economy. Even if local businesses fully capitalized on visitor demand for services, real economic benefits would probably only be felt by a small number of residents. Nonetheless, because the regional economy is primarily based on manufacturing, agriculture, and mining and has experienced little economic growth during the past 10 years, economic growth related to the park would continue to help diversify and improve that economy. Even these small levels of increase in employment, personal income and taxes, and total business activity could be considered an important economic benefit.

Conclusion. The proposed action would have a positive impact on the regional economy in that it would create additional jobs, increase the total business activity, and provide additional personal income and sales taxes. However, relative to the rest of the economy, the actual economic benefit would be small and the principal impact has already occurred. Great Basin National Park has not generated, and under the proposed action would not generate, a boom economy.

Cumulative Impacts. There would be no significant cumulative impacts on the regional economy as a result of the proposed action.

Many activities previously enjoyed by local visitors – camping, picnicking, hiking, and horseback riding – would continue to be available in the park. However, some uses that were permitted on lands previously under Forest Service administration would no longer be allowed or would be closely regulated. Examples include hunting, trapping, tree cutting, commercial harvesting of pinyon nuts, prospecting, collecting minerals, plants, and animals, unrestricted four-wheel driving, camping in undesignated sites along roads, snowmobiling, mountain biking, and hang gliding. Policies prohibiting or closely regulating these and similar uses would adversely affect local visitors who have traditionally participated in these activities. These effects would be partially mitigated by the fact that other public lands are available in the area where consumptive uses are permitted.

Impacts
on Local
Visitors

Local visitors might also object to the increasing number of other visitors that the national park attracts. There would be increased competition for campsites, more crowding at popular visitor attractions, more hikers on backcountry trails, and generally reduced opportunities for solitude. However, the expanded scope of interpretation and the new visitor facilities would increase opportunities for local visitors to learn about and enjoy the park's many natural, cultural, and recreational resources.

Conclusion. The park would continue to provide opportunities for nonconsumptive recreational activities by local visitors; however, some of these activities would be more closely regulated than in the past. Some consumptive uses would be prohibited or allowed only under permit.

Cumulative impacts. The state of Nevada and the area surrounding the park have a vast amount of public land where consumptive uses and unregulated recreational activities can take place. Therefore, the cumulative impacts of the proposed action on local visitors would be minimal.

Analysis. Most nonlocal visitors in the past came to tour Lehman Cave. Some also visited the Forest Service Wheeler Peak Scenic Area, but very few ventured into other areas of what is now Great Basin National Park.

Impacts
on
Other
Visitors

The proposed action would open new areas for exploration and discovery and would greatly improve orientation,

PROPOSED ACTION

information, and interpretation of the park and its regional setting. Through management zoning, it would establish and maintain a range of experiences - from highly structured and organized to rustic to primitive - permitting visitors to enjoy the park's diverse resources and attractions at their own pace.

Visitors would be made aware of the Great Basin region before they entered the park through interpretation at the four highway exhibit shelters. These shelters and the new Baker orientation center would set the stage for park experiences, allowing visitors to familiarize themselves with the park and region and to plan activities according to their interests.

The new eastern extension of Wheeler Peak Scenic Drive from Highway 487 to the park boundary would provide a more aesthetic and pleasing approach to the park, setting the scene for Great Basin experiences. The 11 interpretive pullouts along the scenic drive (five along the approach and six inside the park) would introduce visitors to all of the region's major life zones and scenic and historic resources.

Films, slide shows, exhibits, and programs in the new Baker Ridge visitor center would provide interpretation of the entire Great Basin physiographic region, broadening the currently narrow interpretive emphasis on caves to encompass a wide spectrum of natural and cultural history themes. The outdoor viewing deck at the visitor center would offer panoramic views of the basins to the north, east, and south, dramatically illustrating this primary park theme. The redesigned Lehman Cave interpretive center would include additional space for in-depth cave interpretation.

Support facilities and services in the new visitor center and interpretive center would enhance visitor experiences. Convenient parking, barrier-free pathways, picnic areas, shade structures, seating, and restrooms would make visits to these facilities more pleasant. At the interpretive center, cave tour ticket sales would be relocated to a kiosk near the new parking area to reduce congestion and eliminate conflicting uses in the center.

Interpretive and recreational opportunities in other areas of the park would also be enhanced through improved access, upgraded facilities, and an expanded and rehabilitated parkwide trail system. Pullouts and trails along Wheeler Peak Scenic Drive would interpret significant resources and features, and a new staging area at the end of the scenic drive would improve access into the Wheeler Peak day use

area. Camping opportunities would be increased at Baker Creek and Lehman Flats. Sites and features in Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch would be opened to two-wheel-drive travel, and more rustic camping and hiking opportunities would be available in these areas. Interpretive panels at all trailheads and campgrounds would provide orientation to specific areas of the park. New barrier-free facilities and modified existing facilities - including two new trails, two campsites, and all pullouts, parking and staging areas, and restrooms - would make more areas of the park accessible to disabled visitors.

Opportunities to explore the park's backcountry would be greatly expanded through the repair and rehabilitation of existing trails and the construction of nine new trail segments, which would link existing trails to provide a parkwide system of trails. Large areas of the park would be zoned primitive and reserved for wilderness experiences.

A number of actions in the plan would reduce potential safety hazards or eliminate undesirable conditions in the park. Shoulder widening and road stabilization would improve safety and accessibility at points of interest along the Wheeler Peak Scenic Drive. Relocation and expansion of the Wheeler Peak pullout/trailhead would reduce congestion and pedestrian hazards at the existing trailhead parking area. Paving the Baker Creek spur road would permit easy access to the new Great Basin visitor center and would eliminate the sometimes high amounts of ambient dust in the vicinity. Upgrading roads from dirt to gravel at Strawberry Creek, Snake Creek, Big Wash, and Lexington Arch would allow safe two-wheel-drive access to these areas. Eliminating a portion of the Grey Cliffs campground would reduce potential safety hazards there in the event of the flash flood. Removing equipment and hazardous materials from mines and stabilizing mine shafts would increase safety for backcountry users.

Prohibiting oversized vehicles and RVs from traveling up Wheeler Peak Scenic Drive beyond Lehman Curve would inconvenience visitors in such vehicles who had no alternate means of transportation. However, this prohibition would improve safety for other motorists using the scenic drive.

Conclusion. The proposed action would greatly expand visitor understanding and appreciation of the park and the Great Basin physiographic region by establishing and creating an interpretive experience on the new Wheeler Peak Scenic Drive, opening a new visitor center on Baker Ridge, and generally improving interpretive services throughout the

park and region. It would also open many new areas of the park, permitting visitors to choose among experiences ranging from highly structured to rustic to the most primitive.

Cumulative Impacts. There would be no cumulative impacts on other visitors as a result of the proposed action.

MANAGEMENT

Impacts on Park Management and Operations

Analysis. Substantial increases (above 1989 staffing and funding levels) in law enforcement and resource management personnel and funding would be required to

handle the 20 to 25 percent increase in visitation that is projected over the next 10 years

monitor use on the new 7-mile extension of Wheeler Peak Scenic Drive (entrance road)

support increasing use in the Snake Creek, Strawberry Creek, and Lexington Arch portions of the park

monitor increasing backcountry use (approximately 79 miles of trails would be designated and maintained as compared to the 20 miles of currently maintained backcountry trails)

monitor the more remote locations along the park's western boundary

implement the management zoning system and monitor activities

complete a biological inventory and implement a *limits of acceptable change* monitoring program

implement and administer the allotment management plans, water resources management plan, fire management plan, and cave management plan

Substantial increases in maintenance personnel and funding would also be required to repair, upgrade, and maintain the expanded backcountry trail system; the developments associated with the new visitor center, the Lehman Cave ticket sales and interpretive center, and the Wheeler Peak pullout/trailhead; the new and existing campgrounds, campsites, and trailheads; the regional and park interpretive pullouts; the new visitor orientation, housing, and administrative facilities at the Baker site; the expanded water and sewer treatment system; and the additional 37 miles of access roads outside the park boundary. There would be slight increases in travel time (10 minutes) for maintenance

workers to get from the proposed maintenance area in Baker to the park's main developed area. From the proposed maintenance area, workers would have slightly shorter travel distances to other visitor use areas on the east side of the park, including Lexington Arch, Snake Creek, and Strawberry Creek.

Slight increases in interpretive personnel and funding would be needed to support interpretive programs and services at the new visitor center and the Wheeler Peak day use area.

Additional personnel would be needed to manage the 40 percent increase in park staff and associated increases in purchasing needs.

Moving most park employees to the Baker administrative site and constructing additional housing there would affect park employees in several ways. Day-to-day contacts and opportunities for social interaction between park employees and Baker community residents would increase, while similar contacts with current park neighbors would decrease. Park employees would be placed closer to the services that the town of Baker offers (the elementary school, community center, restaurant, store, post office, etc.) but farther from the recreational opportunities available in the park (hiking, fishing, cafe, etc.). Because of the higher summer temperatures at the Baker site (as compared to temperatures in the existing park housing area), cooling costs would be higher for employees housed in Baker. Costs would be partially mitigated by incorporating more efficient insulation and heating/cooling devices into the new housing units. Finally, placing the housing area near the town of Baker would increase commuting time for employees working in the park. Using the existing park entrance as a service road, commuting time to the park from the administrative site would be approximately 10 minutes. Administrative personnel who worked in the park's new administrative building would be within walking distance.

Analysis. The proposed action would add two sections (1,280 acres) of USFS-administered land to the park. These sections are just east of the proposed visitor center on Baker Ridge. Because the two sections are isolated from other USFS-administered land (on the west by Great Basin National Park and on the east by BLM land), this action would increase the overall efficiency of the federal government in managing public lands.

Impacts on
U.S. Forest
Service and
Bureau of
Land
Management
Operations

TABLE 13: PROPOSED RIGHTS-OF-WAY THROUGH USFS AND BLM LAND - PROPOSED ACTION

	Approximate Mileage through USFS Land	Approximate Acres of Proposed Right-of-Way	Approximate Mileage through BLM Land	Approximate Acreage of Proposed Right-of-Way
New Park Entrance	—	—	7.3	725
Strawberry Creek Road	0.5	25	2.2	106
Snake Creek Road	1.3	65	4.2	204
Big Wash Road	2.9	144	6.5	315
Lexington Arch Road	1.8	190	7.7	373

The proposed action would also involve NPS acquisition of rights-of-ways along several roads that enter the park and upgrading of these roads where they cross USFS and BLM land before reaching the park. Table 13 indicates the length of these roads and the approximate amount of land that would be involved in the proposed rights-of-way for the park access roads.

When the Park Service assumed responsibility for maintenance on these roads, the Forest Service and Bureau of Land Management would no longer have to spend time and funds to maintain them and could use maintenance resources elsewhere. Both agencies would use these roads for the management of lands adjacent to NPS rights-of-way. Lands within the rights-of-way would still be available for traditional uses, including recreation, grazing, developments, and public and private uses, as long as they did not cause visual intrusions on the rights-of-way.

Conclusion. There would be few impacts on the Forest Service and Bureau of Land Management as a result of the proposed action. Land transfers and NPS rights-of-way would increase the overall efficiency of public land administration in the Great Basin region.

Cumulative impacts. There would be no known cumulative impacts on the Forest Service or the Bureau of Land Management as a result of the proposed action.

A total of approximately 120 acres of undisturbed or minimally disturbed land would be directly affected by the proposed action. Impacts would range from complete vegetation removal and light excavation, grading, and surfacing to selective tree cutting and brush removal for vista improvement and fuel reduction around structures, campgrounds, and other public use areas. An estimated 25.3 acres currently disturbed by campsites, roads, and buildings would be rehabilitated, for a net acreage of 95 acres adversely affected by the proposed action.

UNAVOIDABLE
ADVERSE
EFFECTS

Table 14 summarizes the unavoidable adverse impacts on public lands managed by the Park Service, Bureau of Land Management, and Forest Service as a result of the proposed action. The impacts are in two categories - moderate and severe. A moderate impact is defined as disturbance of vegetation and soils by such activities as foot traffic or installation of utilities; a severe impact is defined as the exclusion of vegetation by paving, building, or removing soil during excavation. Table 15 describes the vegetation communities that would be affected by these actions.

TABLE 14: UNAVOIDABLE ADVERSE IMPACTS BY TYPE OF DISTURBANCE

	Impacts on NPS Land		Impacts on BLM Land		Impacts on USFS Land	
	Moderate	Severe	Moderate	Severe	Moderate	Severe
Roads and Parking Lots	0	26.2	0	34.9	0	7.8
New Buildings	0	8.1	0	0	0	0
Corrals, Trails, Backcountry Camps	18.3	0	0	0	0	0
Campgrounds (Modern and Rural)	17.3	0	0	0	0	0
Sewage Treatment and Utilities	1.7	0	2.2	8.0	0	0
Rehabilitated Areas	(8.6)	(18.4)	0	0	0	0
Net Impacts	28.7	15.9	2.2	42.9	0	7.8

TABLE 15. UNAVOIDABLE ADVERSE IMPACTS BY HABITAT TYPE (IN ACRES)

	Moderate	Severe	Total
Pinyon-Juniper	15.3	9.9	25.2
Shadscale-Desert Shrub	6.0	53.0	61.0
Mountain Mahogany	0	0.1	0.1
Aspen	4.2	2.8	7.0
Riparian Shrub	(6.9)	0	(6.9)
Mixed Conifer	10.2	0.7	10.9
Spruce Forest	0	0.6	0.6
Bristlecone Pine	0	0	0
Alpine	0	0	0

Note: Numbers in parentheses indicate decreases in disturbed acreage.

There would continue to be unavoidable impacts on park vegetation from domestic livestock grazing, primarily in riparian areas, wet meadows, and around water troughs and other areas frequented by livestock. Vegetation disturbance would also likely affect wildlife, but it is difficult to quantify those effects or to determine which species would be most affected.

RELATIONSHIP OF SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY	The primary short-term uses of the park would include domestic livestock grazing, mining, and recreational use. Grazing livestock would continue to compete with native species for available forage and would contribute to soil erosion and degradation of riparian areas and aquatic and wetland habitats. They would be likely to introduce additional nonnative plant species into the park and might also introduce ungulate diseases into native wildlife populations. The proposed action would minimize these adverse effects by allowing grazing only in the most resistant areas of the park, however, some adverse effects on long-term productivity could be expected.
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Mining in the park has the potential to adversely affect significant amounts of land in the sensitive subalpine and alpine areas surrounding Mt. Washington, although it is impossible to predict the number of claims that might eventually be mined. Under the proposed action, mining plans of operation would not be approved unless actions or mitigating measures were included demonstrating that the

mining activities would not result in damage to important park resources. If plans of operations were denied, the Park Service would have to purchase the claims using congressionally appropriated funds. If Congress did not appropriate the funds to acquire the properties, the Park Service might be unable to stop mining operations. If all lands covered by claims were mined, this could total 6,400 acres.

Recreational uses would not have significant effect on long-term productivity.

Irreversible commitments of resources include consumption or destruction of nonrenewable resources such as minerals and archeological remains. Under the proposed action, the Park Service would protect all archeological resources to the extent practical; however, nationally significant sites would have first priority, and the protection of other sites would depend on manpower and budget constraints. It is likely that some archeological sites would be subject to damage from vandalism, fire, domestic livestock grazing, or construction activities, resulting in irreversible losses of artifacts and cultural information of regional or local significance.

**IRREVERSIBLE
AND
IRRETRIEVABLE
COMMITMENT
OF RESOURCES**

The proposed action would permit, under certain circumstances, mining of existing valid claims within the park. Any minerals or ore removed from the park would be irreversibly lost.

Irretrievable commitments of resources are uses of renewable resources such as forage or wildlife habitat that may cause them to be lost because the lands providing these resources are allocated for other uses. The bighorn sheep, perhaps the most sensitive resource in the region, is known to be declining in numbers and will almost certainly be lost as a species from the South Snake Range. Domestic sheep grazing is thought to be adversely affecting this species. However, even if grazing were prohibited within the park, it is doubtful that bighorn sheep would recover because a major portion of their habitat lies outside park boundaries where domestic livestock grazing would likely continue.

Although most proposed developed areas could be restored to previous conditions over time, the use of land and financial resources to implement the proposed action would, in the practical sense, be an irretrievable commitment of resources.

ALTERNATIVE A - NO ACTION/MINIMUM REQUIREMENTS

BIOLOGICAL AND PHYSICAL RESOURCES

Impacts on Bristlecone Pine Forests

Analysis. Under alternative A, reconstruction and improvement of the trail system through the bristlecone stand in the Wheeler Peak cirque would provide additional definition to the trail tread, thereby protecting the pines from additional soil compaction and trampling caused by off-trail use and the lack of a continuous protective trail tread near their roots. The Mt. Washington road would be closed at the park boundary, providing increased protection for the bristlecone pines in that area. The potential for direct impacts from vehicles and vandalism or inadvertent damage by visitors would be much less than at present.

Alternative A would not zone the bristlecone stands surrounding Mt. Washington as a research natural area or the other high-elevation bristlecone stands as protected natural areas. The primary consequence of this action would be that livestock grazing would be permitted in bristlecone stands. Although there is little available forage in most of the stands, domestic sheep do enter them occasionally and could have adverse impacts on individual mature trees, seedlings, and the thin soils in these areas.

Conclusion. Alternative A would provide limited additional protection for bristlecone stands. The stands would be partially protected from human damage or vandalism because of their remote locations.

Cumulative Impacts. The cumulative effect on bristlecone pines under this alternative would be negligible.

Impacts on Riparian Areas and Water Quality

Analysis. Alternative A would involve no changes in current grazing management practices in the park; therefore, domestic livestock grazing would continue to have adverse effects on riparian areas through the reduction of vegetation along stream corridors, soil compaction and erosion from trampling, the introduction of nonnative plant species, and the alteration of natural species composition in plant communities. Water quality in the streams in riparian areas would also continue to be adversely affected through physical/chemical modification caused directly or indirectly by the presence of livestock.

The Lower Lehman Creek campground, which is in the riparian area of Lehman Creek, and the portion of the Gray Cliffs campground that is in the riparian area of Baker Creek would also be removed under this alternative. Removal of

about 50 campsites along about 600 linear feet of Baker Creek and 200 linear feet of Lehman Creek would eliminate direct and indirect human impacts on approximately 2 acres of riparian lands. There would be no adverse effects on the wild and scenic river values of the South Fork of Big Wash.

Conclusion. Domestic livestock grazing would continue to be the major man-caused adverse effect on riparian areas. Approximately 2 acres in the riparian areas of Lehman and Baker creeks would be restored.

Cumulative Impacts. The cumulative impacts on riparian areas would be negligible.

Analysis. No developments other than minor trail and backcountry campsite improvements would be provided in alpine and subalpine areas. The elimination of all vehicular access and the rehabilitation of existing access roads and routes would have positive effects on the appearance and ecological conditions in these areas.

Impacts on Alpine/ Subalpine Areas

The known rare and sensitive alpine and subalpine plant species are generally in areas of very sparse vegetation. However, because this alternative would not zone alpine and subalpine lands as protected natural areas, some grazing would continue to occur there, possibly causing impacts on rare and sensitive species.

Conclusion. No major developments would be included in alpine and subalpine areas. Domestic livestock grazing would continue and could adversely affect some rare and sensitive plant species.

Cumulative Impacts. There are few other mountain ranges in the region with large areas of alpine and subalpine vegetation. Continuing to allow grazing above 10,500 feet would adversely affect the park's alpine areas in the future.

Analysis. Alternative A would have the following impacts on rare and sensitive species.

Impacts on Rare and Sensitive Plant Species

Impacts from Domestic Livestock Grazing. The majority of the park's rare and sensitive plant species inhabit areas above 10,500 feet in elevation and depend on the alpine/subalpine habitat. Under this alternative domestic livestock grazing would continue to be allowed in all high

elevation areas, which could have adverse effects on species in some locations.

Impacts from Mining - The impacts on rare and sensitive plant species could result from direct excavation, creation of spoil areas, machine operation, and other mining activities. Before approving any claimant's proposed plan of operation, the Park Service would evaluate the area for the presence of such species.

Impacts from Recreational Use - Most of the known rare and sensitive plant species occur in the alpine and subalpine communities far south of the popular attractions around Wheeler Peak and well removed from heavily trafficked areas. These species are also generally protected from human disturbance by their rocky cliff habitats.

Under alternative A no new backcountry trails would be established in alpine and subalpine areas. However, if visitor use in these areas increased, trampling could occur along self-made corridors, resulting in greater impacts on vegetation than if a trail was constructed.

The Mt. Washington road, a major access point to the ridges that contain rare and sensitive plant habitat, would be closed. This would reduce direct human and vehicular impacts on the plants and their habitats in this area.

Conclusion. Rare and sensitive plant species would receive limited additional protection under this alternative. Domestic livestock grazing, mining, and random human travel could adversely affect these species.

Cumulative Impacts. Many of the rare and sensitive species in the alpine and subalpine communities of the park are found in few other locations. In many cases a few individual plants are scattered over a wide area. Therefore, seemingly minor impacts to a few individual plants, like those caused by domestic livestock grazing, could have serious adverse effects on some of these species.

It is impossible to accurately assess the impacts on any of the rare and sensitive park species as a result of this alternative. Given the rugged habitats of most of these species, it is unlikely that domestic livestock grazing could affect an entire species to the point of extinction; however, over time some individual habitats could be adversely affected and some species eliminated from those areas.

Analysis. No development would occur near the identified recovery area for peregrine falcons on the west side of the park. Closing the Mt. Washington road would minimize human presence in the area, reducing the possibility of disturbance to the birds. The Park Service would cooperate in peregrine recovery efforts in the region.

Impacts on
Peregrine
Falcons

Conclusion. Park Service involvement in the peregrine recovery effort would help to reestablish this species in the park and surrounding region. The potential for disturbance of peregrine habitat in the Mt. Washington area would decrease with road closure.

Cumulative Impacts. Peregrine falcon recovery depends upon nationwide actions. Recovery plans have been developed for many areas of the West, and reintroductions have been attempted in every western state. By supporting the reintroduction of peregrine falcons and reducing the human intrusions in the recovery area, this alternative would benefit peregrine falcon recovery on both a regional and national scale.

Analysis. Alternative A would not provide additional protection to the existing population of Bonneville cutthroat in Pine and Ridge creeks in the northwest corner of the park, and domestic livestock grazing could adversely affect much of the aquatic habitat in these two streams. In addition, Bonneville cutthroat would not be reintroduced into waters on the east side of the park. The species would continue to be very susceptible to a random event such as a flood or drought that could destroy the single population that exists.

Impacts
on
Bonneville
Cutthroat
Trout

Conclusion. No actions would be taken that would increase or reduce threats to the Bonneville cutthroat trout within the park.

Cumulative Impacts. If the populations of Bonneville cutthroat trout within the park were lost, this would represent a relatively serious loss of a valuable genotype on a national or regional scale and could hamper efforts to help this species recover.

Analysis. Threats to the biological diversity of the park include invasion of native plant habitats by competitive nonnative species; disturbance and alteration of natural plant communities by domestic livestock grazing, mining, ground-disturbing developments, and human use; development of overly mature plant communities because of the suppression of natural fires; and climatic changes resulting from environmental factors. Alternative A would

Impacts
on
Biological
Diversity

have only minor effects in reducing those threats except for those associated with fire suppression.

Conclusion. There would be few effects on biological diversity within the park as a result of this alternative. Grazing would continue to affect the natural diversity of vegetation of the park. Prescriptions for allowing natural fires to burn would have a positive effect in ensuring natural biological diversity.

Cumulative Impacts. There would be no known cumulative impacts on the biological diversity as a result of this alternative.

Impacts on Caves

Analysis. Several developments would be constructed on or near areas with the potential for underlying caves, including additional park housing near the existing housing area and an expanded maintenance area. New construction would disturb approximately 5 acres with the potential for underlying caves. The Park Service would perform seismic investigations before constructing proposed facilities, and this information would be used to develop mitigating measures to eliminate the possibility of adversely affecting caves. If caves were determined to be near the surface and if it could not be assured that the proposed developments would not affect natural cave conditions, including percolation and subsurface water movements, developments would be planned and built elsewhere. No existing facilities in areas with the potential for underlying caves would be removed under this alternative.

Alternative A would not remove any existing developments from areas with the potential for underlying caves.

Conclusion. This alternative would increase the number of facilities in areas with the potential for underlying caves. Seismic investigation before construction would prevent or mitigate any impacts on cave resources.

Cumulative Impacts. There would be minor cumulative effects on areas with the potential for underlying caves as a result of this alternative.

Impacts on Air Quality

Analysis. Slight increases in automobile emissions would occur as a result of increased visitation, and dust levels would be high at times along unpaved park roads, in particular the Baker Creek road. Building and utility construction would result in temporary localized increases in particulates. Machinery emissions and increased airborne dust from construction activities would decrease air quality in

the vicinity of the project sites. Normal conditions would return when construction was completed.

Any prescribed burning in the park would result in temporary decreases in air quality. The Park Service would work with the Nevada state agencies to minimize any adverse effects.

Conclusion. The impacts on the park's air quality would be minor.

Cumulative Impacts. This alternative would not have any measurable cumulative effects on regional air quality.

Impacts on Vistas

Analysis. The sewage lagoons, proposed administration building, maintenance yard, and large residential complex would have a detrimental effect on the views from various vantage points along the Wheeler Peak road, at Wheeler Peak, and from trails on the east side of the South Snake Range. Visitors standing on the front porch of the Lehman Cave visitor center would have to look out over the vehicles in the upper and lower parking lot to view the Snake Valley below.

No specific actions would be taken to protect vistas outside the park. The vistas associated with Spring Valley and Snake Valley would have a very high probability of being compromised over time because of incompatible developments and land uses.

Conclusion. NPS operational and support facilities would continue to detract from views at various vantage points in the park. Incompatible developments and land uses would constitute a major threat to significant vistas outside the park boundary.

Cumulative Impacts. There would be no cumulative impacts on vistas as a result of alternative A.

Impacts on Floodplains and Wetlands

Analysis. Alternative A would remove the entire Lower Lehman Creek campground and the portion of the Grey Cliffs campground that is across the creek from the Baker Creek road. The Lower Lehman Creek campground would be removed because the high water table during the spring season causes wet and muddy conditions in some of the campsites. Approximately three-fourths of the Grey Cliffs campground would be removed to eliminate hazards from possible flash floods. A new campground would be built at Lehman Flats to replace the sites removed from the Lower Lehman Creek and Grey Cliffs campgrounds and to provide some additional campsites. The site of the new campground

would be well above Lehman Creek and out of its apparent floodplain.

This alternative would not involve management measures to separate grazing livestock from riparian areas. Therefore, the existing impacts on riparian wetlands from grazing would continue.

Conclusion. This alternative would have beneficial effects on wetlands in areas where campgrounds were removed and would also reduce safety hazards in these areas. Impacts on wetlands from domestic livestock grazing would continue at present levels.

Cumulative Impacts. There would be few cumulative impacts on wetlands and no cumulative impacts on floodplains as a result of this alternative.

Impacts on Soils

Analysis. The proposed developments would cause approximately 24 acres of soil disturbance. Of this total, 0.13 acres (less than 1 percent) would be on land administered by the Forest Service, and the rest (more than 99 percent) on land within the park. Most of the soil disturbance would result from construction of new buildings and campgrounds, with lesser amounts resulting from construction or rehabilitation of trails, roads, sewage treatment facilities, and other developments. An estimated 7.4 acres of previously disturbed soils would be rehabilitated and revegetated. Most of the new soil disturbance would be in the pinyon-juniper vegetation type. Lesser amounts of disturbance would occur in shadscale, mixed conifer, aspen, and other types.

The grazing management actions proposed in this alternative would likely result in little change in the potential for soil erosion.

Conclusion. The total area of soil disturbed by developments under this alternative would be 24 acres. Most of the disturbance would be on land inside park boundaries and would be associated with new buildings and campgrounds. Grazing would continue to contribute to soil erosion.

Cumulative Impacts. Over time, domestic livestock grazing would continue to cause soil erosion. To a lesser degree, recreational activities such as hiking and horseback riding, which would likely increase, would also cause minor amounts of soil erosion along trail corridors.

Analysis. Under alternative A cultural resource management actions would be limited. Minimal preservation/stabilization and interpretive treatment would be accorded the three National Register sites; no additional preservation or rehabilitation work would be carried out at the Osceola ditch. The Johnson mill and mine would be evaluated, and appropriate treatment specified based on their National Register eligibility. Additional properties meeting National Register criteria would be nominated. Other sites would be left to deteriorate naturally, consistent with visitor safety requirements and the provisions of federal historic preservation laws and NPS management policies. Sites with historical archeological elements would require consultation with the state historic preservation officer on treatment. The Park Service would seek to avoid adverse effects resulting from new development in the archeological zone at the Lehman Flats campground.

Conclusion. This alternative would not result in any significant additional impacts on cultural resources.

Cumulative Impacts. There would be no cumulative effects on cultural resources as a result of this alternative.

Analysis. Because alternative A recommends no changes in the management of grazing in the park, the actions to be taken would have no effect on grazing permittees.

Conclusion. The actions in this alternative would have no effect on grazing permittees.

Cumulative Impacts. No cumulative impacts are expected as a result of this alternative.

Analysis. Mining claimants within the park boundary would have to submit plans of operations for review and approval by the park superintendent before initiating any work related to mining. Before such plans were approved, the Park Service would conduct validity examinations on all claims. This would have two major effects on the claimants. First, there would be a delay in review and approval of any plan of operations that was submitted. This delay could be as long as one to two years. Second, if it was determined that a claim was invalid, the Bureau of Land Management would initiate procedures to extinguish it. The decision to extinguish a claim would be subject to appeal.

Mining operations cannot be denied without compensation on a valid mining claim with an approvable plan of operations. If a claim was determined to be valid, the Park Service would

CULTURAL RESOURCES

SOCIOECONOMIC ENVIRONMENT

Impacts on Livestock Grazing Permittees

Impacts on Mineral Interests

have to decide whether to allow operations under an approved plan or to purchase the claim at fair market value. For most claims, especially those in the area surrounding Mt. Washington, the decision would be to purchase. NPS purchase of mining claims would eliminate the possibility of future mining and mineral exploration in those areas.

Owners of patented or valid unpatented mining claims outside the boundary who required access across park lands to mine their claims would also have to submit plans of operations for approval by the Park Service. If the Park Service decided not to approve a plan for a patented mining claim, it would have to purchase the property at its appraised value.

Conclusion. The owners of mining claims within the park could be substantially affected if their claims were determined to be valid and they wished to mine; however, the Park Service would be required to purchase any valid claims on which it denied approval of the plans of operations. It is probable that the vast majority of these claims are invalid and would never be mined. Therefore, the economic impacts on mineral interests would be minimal for the foreseeable future.

Cumulative Impacts. Unless there is a major unknown mineral deposit in the park, the cumulative impacts of this alternative would be negligible.

Impacts on
Residents
and Private
Property
Owners

Analysis. The 15 to 20 private homeowners who live along the existing entrance road could expect slightly increased traffic, traffic noise, and potential for traffic accidents as a result of proposals in alternative A. This could detract from the quality of life for these residents.

Owners of property adjacent to the park boundary and close to exceptional resources within the park could expect concern from the Park Service and public about any development, activity, or proposed activity that threatened exceptional resources. In such an event, the Park Service would work with the property owner and local, county, and state governments to ensure protection of resource values.

Conclusion. Residents along the existing entrance road would experience slightly more traffic and traffic noise as park visitation increased; other landowners would notice little change with the implementation of alternative A. Landowners adjacent to exceptional resources in the park might be prevented from developing their land because of Park Service efforts to protect those resources.

Cumulative Impacts. There would be no cumulative impacts on residents and private landowners as a result of this alternative.

Analysis. Alternative A would have the following effects on the regional economy

Impacts on
the Regional
Economy

Construction - Recommended actions would generate \$10,000,000 (net) in construction projects. These projects would have short-term economic benefits and would result in no permanent jobs or long-term economic growth. If all of the projects were awarded to firms in the region, total business activity would increase by \$14,400,000. This level of economic activity would result in the equivalent of 146 full-time jobs and \$5,900,000 in personal income and business taxes. If all projects went to nonregional firms, total economic output would increase by \$9,700,000, creating the equivalent of 89 full-time jobs and \$3,800,000 in personal income and business taxes. Actual economic benefits from alternative A would fall somewhere between these two scenarios.

Operating Budget - Expenditures from the park's current operating budget would increase by \$604,000. Annual expenditures to regional firms or individuals would increase by \$427,000, increasing total economic output by \$726,000. This level of business activity would create an additional 26 full-time equivalent jobs in the region and \$592,000 in personal income and business taxes.

Visitor Expenditures - Visitor use is expected to stabilize at about 78,000 visits per year. This level of visitation would increase visitor spending by \$91,000, resulting in an additional \$125,000 in total regional business activity, the equivalent of 3 full-time jobs, and \$61,000 in personal income and business taxes. If the private sector marketed the park and expanded visitor services to capture more visitor clientele, the length of stay and per-party expenditures could double, with a resulting increase in visitor spending by \$1,695,000. This level of visitor spending would generate \$2,349,000 for regional businesses, 57 full-time equivalent jobs, and \$1,135,000 in personal income and business taxes.

Conclusion. Alternative A would have a small but positive economic impact on the regional economy.

TABLE 16: SUMMARY OF IMPACTS ON THE REGIONAL ECONOMY - PROPOSED ACTION

Construction Expenditures (1990 dollars)

	Total Costs (\$MM)	Total Business Activity (\$MM)	Personal Income and Business Taxes (\$MM)	Total Jobs (FTE)
Pre-Park	0	0	0	0
Existing	0	0	0	0
Future				
Region	10.0	14.4	5.9	146
Nonregion	10.0	9.7	3.8	89

Operating Budget Expenditures (1990 dollars)

	Total Budget (\$000)	Regional Purchases (\$000)	Total Business Activity (\$000)	Personal Income and Business Taxes (\$000)	Total Jobs (FTE)
Pre-Park	256	170	302	230	10
Existing	1,310	874	1,487	1,124	46
Future	1,914	1,301	2,213	1,716	72

Visitor Expenditures (1990 dollars)

	Total Expenditures (\$000)	Total Business Activity (\$000)	Personal Income and Business Taxes (\$000)	Total Jobs (FTE)
Pre-Park	746	1,026	497	25
Existing	1,513	2,099	1,013	51
Future				
Stable	1,604	2,224	1,074	54
Enhanced	3,208	4,448	2,148	108

Cumulative Impacts. There would be no significant cumulative impacts on the regional economy as a result of this alternative.

Analysis. Camping, picnicking, hiking, horseback riding, and many other activities previously enjoyed by local visitors would continue to be available in the park. However, hunting, tree cutting, unrestricted four-wheel driving, camping in undesignated sites along roads, trapping, commercial harvesting of pinyon nuts, prospecting, and collecting minerals, plants, and animals would no longer be allowed. Policies prohibiting or closely regulating these and similar uses would adversely affect local visitors who have traditionally participated in these activities. These effects would be partially mitigated by the fact that other public lands are available in the area where consumptive uses are permitted.

Impacts
on
Local
Visitors

Local visitors might also object to the increasing number of other visitors that the national park attracts. There would be increased competition for campsites, more crowding at popular visitor attractions, more hikers on backcountry trails, and generally reduced opportunities for solitude.

Conclusion. The park would continue to provide opportunities for nonconsumptive recreational activities by local visitors; however, some of these activities would be more closely regulated than in the past. Some consumptive uses would be prohibited or allowed only under permit.

Cumulative Impacts. The state of Nevada and the area surrounding the park have a vast amount of public land where consumptive uses and unregulated recreational activities can take place. Therefore, the cumulative impacts on local visitors would be minimal.

Analysis. Although orientation, information, and interpretation would be improved under this alternative, no new interpretive facilities would be provided to highlight the theme of the Great Basin physiographic region. There would be no regional exhibit shelters, no orientation in the town of Baker, and no new visitor center media or viewing areas in the park. Opportunities to gain a better understanding and appreciation of the park's natural and cultural history would be limited.

Impacts
on
Other
Visitors

No new areas would be opened to visitor use under this alternative, and people would tend to concentrate in existing use areas in the northern part of the park. Some interpretive and recreational facilities would be improved. Administration

ALTERNATIVE A - NO ACTION/MINIMUM REQUIREMENTS

would be relocated out of the Lehman Cave visitor center, and the center would be redesigned to include additional information and orientation services and barrier-free access. Existing interpretive pullouts along the Wheeler Peak road would be upgraded, and one new pullout would be established along the park entrance road. Camping opportunities would increase at Baker Creek and Lehman Flats, and campsites would be designated in Strawberry Creek and Snake Creek. Rehabilitated trails would permit access into some of the park's backcountry.

Several actions would reduce potential safety hazards or eliminate undesirable conditions. Shoulder widening and road stabilization would improve safety and accessibility at points of interest along the Wheeler Peak road. Relocation of the Wheeler Peak pullout/trailhead would reduce congestion and pedestrian hazards at the existing trailhead parking area. Eliminating a portion of the Grey Cliffs campground would reduce potential safety hazards there in the event of a flash flood. Removing equipment and hazardous materials from mines and stabilizing mine shafts would increase safety for backcountry users.

Prohibiting oversized vehicles and RVs from traveling up the Wheeler Peak road beyond Lehman Curve would inconvenience visitors who had no alternate means of transportation. However, this prohibition would improve safety for other motorists using the road.

Conclusion. This alternative would provide limited additional services for visitors. It would not open new areas of the park for recreation or exploration, and it would not provide a better understanding of the park and its regional setting.

Cumulative Impacts. There would be no cumulative effects on visitors under this alternative.

Analysis. Moderate increases (above 1989 staffing and funding levels) in law enforcement and resources management personnel and funding would be required to handle the 20 to 25 percent increase in visitation that is projected over the next 10 years, monitor the more remote locations along the park's western boundary, implement the management zoning system and monitor activities, and implement and administer the grazing management plan, fire management plan, and cave management plan.

Slight increases in maintenance personnel and funding would be required to maintain the new 50-site Lehman Flats campground, new administration building, and additional park residences. Slight increases in interpretive personnel and funding would be needed to support the modest expansion of interpretive programs in the Wheeler Peak day use area.

Additional administrative personnel would be needed to manage the 22 percent increase in park staff and associated increases in purchasing needs.

Analysis. This alternative would not add any BLM or USFS lands to the park. The only land outside the boundary that would be affected would be the small site needed to establish a trailhead and parking area for Lexington Arch. This action would be handled through a cooperative agreement with the two agencies.

The management of the grazing allotments that cross jurisdictional boundaries would continue to require close coordination between the Bureau of Land Management, Forest Service, and Park Service.

Conclusion. There would be no impacts on the Forest Service or Bureau of Land Management as a result of this alternative.

Cumulative Impacts. There would be no cumulative impacts on the Forest Service or BLM.

MANAGEMENT

Impacts on
Park
Management
and
Operations

Impacts on
U.S. Forest
Service and
Bureau of Land
Management
Operations

ALTERNATIVE B - BACKCOUNTRY EMPHASIS

BIOLOGICAL AND PHYSICAL RESOURCES

Impacts on Bristlecone Pine Forests

The impacts on bristlecone pines under alternative B would be the same as under the proposed action. Reconstruction and improvement of the trail system in the Wheeler Peak semi-primitive day use subzone would protect the pines in that area from additional soil compaction and trampling. Closing the Mt. Washington road at the park boundary would provide increased protection for the bristlecones there by reducing the direct impacts of four-wheel-drive vehicles on roots and soils as well as the possibility of vandalism or inadvertent physical damage to individual trees. In addition, this stand would be zoned as a research natural area and would be managed to provide the greatest possible protection of its research values. Most other bristlecone stands would be zoned as protected natural areas, which would have positive indirect effects on the trees because these zones would be managed to perpetuate ecological values and minimize human intrusion.

Under this alternative, domestic livestock grazing would be prohibited in the semi-primitive day use, protected natural area, and research natural area subzones. Although there is little available forage in any of the known bristlecone pine stands and livestock rarely enter them, this action would provide additional protection by eliminating any random livestock activities that might directly affect the mature bristlecone pines or tree seedlings.

Conclusion. This alternative would provide increased protection for the bristlecone pine stands in the park.

Cumulative Impacts. This alternative would have a limited cumulative effect on bristlecone pines on a regionwide scale, but it would have a positive cumulative impact on the bristlecone pine population in the national park system by ensuring protection of the most outstanding trees in the system. In addition, designating the Mt. Washington stand as a research natural area would contribute to understanding of the environmental requirements and life history of this species.

Impacts on Riparian Areas and Water Quality

Analysis. Livestock grazing would continue to have adverse effects on riparian areas in the short term, primarily because of the reduction of vegetation along stream corridors but also as a result of soil compaction and erosion from trampling, the introduction of nonnative plant species, and the alteration of natural species composition in plant communities. Water

quality in the streams in riparian areas would also continue to be adversely affected through physical/chemical modification caused directly or indirectly by the presence of livestock. When the grazing management plan was completed and methods were devised for effectively separating grazing livestock from riparian areas, conditions in these areas should improve. However, because of the large amount of forage in riparian areas and the strong preference of livestock for these areas, as long as livestock continued to graze in the park, it is unlikely that they would ever be completely eliminated from riparian areas. Methods to separate livestock from riparian areas might also result in additional grazing impacts on vegetation and soils on the open slopes above riparian areas.

This alternative would remove the Lower Lehman Creek campground, which is in the riparian area of Lehman Creek, and the portion of the Gray Cliffs campground that is in the riparian area of Baker Creek. Removal of a total of 51 campsites along about 600 linear feet of Baker Creek and 200 linear feet of Lehman Creek would eliminate direct and indirect human impacts on approximately 2 acres of riparian lands. There would be no adverse effects on the wild and scenic river values of the South Fork of Big Wash.

Conclusion. Domestic livestock grazing would continue to be the major man-caused adverse effect on riparian vegetation and habitat; however, this effect would be less than it is today. Approximately 2 acres of currently disturbed riparian lands would be restored.

Cumulative Impacts. Because of the apparent damage in many of the riparian areas in the region, any improvement in riparian habitat in the park would have a positive cumulative impact on riparian areas on a local and regional scale.

Analysis. Proposals to limit development, eliminate vehicular access, and rehabilitate existing roads and routes in alpine and subalpine areas would have positive effects on the appearance and ecological conditions of these areas. Zoning areas above 10,500 feet as protected natural areas, thereby eliminating grazing, would benefit the known rare and sensitive alpine and subalpine species and the communities in which they grow.

Impacts on Alpine/ Subalpine Areas

Conclusion. Actions proposed in this alternative would afford additional protection for alpine and subalpine communities.

Cumulative impacts. Because there are few other mountain ranges in the region with large areas of alpine and subalpine vegetation, actions taken to protect the communities within the park would have a substantial positive cumulative effect on a regional scale.

Impacts on
Rare and
Sensitive
Plant
Species

Analysis. Domestic livestock grazing, mining, and trail construction could affect rare and sensitive species in the park. However, a number of actions would be taken under this alternative that would reduce or mitigate the effects. These include prohibiting grazing in high elevation areas that contain such species, employing management methods to separate grazing livestock from rare and sensitive plants in lower elevation areas, evaluating mining proposals for their effect on rare and sensitive species, and aligning new trails to avoid all areas where such species exist. In addition, the Mt. Washington road would be closed to vehicular traffic, and most of the park's rare and sensitive plant habitat would be included in the protected natural area or research natural area subzone.

Conclusion. Actions taken under this alternative would generally reduce or mitigate potential impacts on rare and sensitive species, thus affording them additional protection.

Cumulative impacts. This alternative would aid in perpetuating individual species and the integrity of their communities and would have a positive cumulative effect on a regional scale.

Impacts on
Peregrine
Falcons

Analysis. The Park Service would actively cooperate in reestablishing the peregrine falcon in the South Snake Range and maintaining a core population of breeding birds in the park vicinity. No developments would be provided in or near the identified peregrine falcon recovery area on the west side of the park, and the Mt. Washington road would be closed, which would substantially reduce the possibility of humans disturbing nesting birds.

Conclusion. Park Service involvement in the peregrine recovery effort would help to reestablish this species in the park and surrounding region. The potential for disturbance of peregrine habitat in the Mt. Washington area would decrease with road closure.

Cumulative impacts. By supporting the reintroduction of peregrine falcons and reducing human intrusions in the

recovery area, this alternative would benefit peregrine falcon recovery on a national scale over time.

Analysis. This alternative would provide additional protection for the existing population of Bonneville cutthroat trout in Pine and Ridge creeks in the northwest corner of the park and would help perpetuate this important genetic resource. The drainages in these two creeks would be zoned as protected natural areas and would receive increased protection over and above that afforded riparian areas in general. Sheep grazing in the past has affected these streams by reducing vegetation cover, eroding streambanks, and directly affecting water quality through fecal contamination and trampling. Under this alternative all domestic livestock grazing would be prohibited in the Pine and Ridge creek watersheds, thus eliminating these adverse effects.

This alternative would also provide the most extensive reintroduction of Bonneville cutthroat on the east side of the park. Reintroducing trout into all east side waters would greatly expand their range and help protect the trout by establishing numerous separate populations, thus lessening the probability of a single event such as a flood eliminating the trout from the South Snake Range.

Conclusion. This alternative would enhance the integrity of existing trout habitat and would increase protection for the population as a whole by reintroducing trout on the east side of the park.

Cumulative impacts. Because of the scarceness of pure populations of Bonneville cutthroat trout on a regional scale, establishing additional populations within their historic range would have an important beneficial cumulative effect on their recovery and preservation.

Analysis. Identified threats to the biological diversity of the park include invasion of native plant habitats by competitive nonnative species; disturbance and alteration of natural plant communities by domestic livestock grazing, mining, ground-disturbing developments, and human use; development of overly mature plant communities because of the suppression of natural fires; and climatic changes resulting from environmental factors. Alternative B would have only minor effects in reducing these threats except for those associated with fire suppression. A rangeland rotation system would be established to help decrease the impacts of grazing on the park's biological diversity. Mining impacts would be controlled through the review and approval process

Impacts on
Bonneville
Cutthroat
Trout

Impacts on
Biological
Diversity

for plans of operations. Rare and sensitive plant communities would be avoided during trail and campsite planning and construction. A fire management plan would be developed with prescriptions for allowing natural fires to burn within the park to help ensure a heterogeneous natural landscape with diverse habitats.

Conclusion. There would be few effects on biological diversity as a result of this alternative. Grazing would continue to affect natural vegetation diversity, although management methods would be employed to encourage livestock grazing in areas with less sensitive resources. Prescriptions for allowing natural fires to burn would have a positive effect in ensuring natural biological diversity.

Cumulative Impacts. There would be no cumulative impacts on biological diversity as a result of this alternative.

Impacts on Caves

Analysis. This alternative would result in the least amount of construction activity in areas with the potential for underlying caves. No major new developments would be constructed on such areas, and three existing developments would be removed (the Lehman Cave visitor center and adjacent parking areas, all park housing, and the maintenance area).

Conclusion. This alternative would have a net positive effect on areas with the potential for underlying caves because some developments would be removed from these areas and no new developments would be built there.

Cumulative Impacts. Actions under this alternative would reduce the potential cumulative impacts on the park's cave resources. Impacts on a regional or national scale would be minor.

Impacts on Air Quality

Analysis. Slight increases in automobile emissions would occur as a result of increased visitation, and dust levels would be high at times along unpaved park roads, in particular the Baker Creek road. Facility construction would result in temporary localized increases in particulates. Machinery emissions and increased airborne dust from construction activities would decrease air quality in the vicinity of the project sites. Normal conditions would return when construction was completed.

Any prescribed burning in the park would result in temporary decreases in air quality. The Park Service would work with the Nevada state agencies to minimize any adverse effects.

Conclusion. The impacts on the park's air quality would be minor.

Cumulative Impacts. This alternative would not have any measurable cumulative effects on regional air quality.

Impacts on Vistas

Analysis. Removing the Lehman Cave visitor center and existing parking lots, park housing, the maintenance area, and the sewage lagoons from the prime resource area of the Baker and Lehman creek drainages would substantially improve views from vantage points on Wheeler Peak Scenic Drive, Wheeler Peak itself, and various trails on the east side of the South Snake Range in the park. Visitors would no longer have to look down on these intrusive developments. The proposed new parking area and ticket sales kiosk/staging shelter north of Lehman Cave would be visible from several vantage points in the park; however, the parking area would be designed and laid out to use the surrounding pinyon forest to help screen and mitigate its impact on park vistas.

As in the proposed action, the Park Service would promote preservation of the visual integrity of the Spring and Snake valleys through review and recommendations concerning development proposals in the region. However, there would still be a high probability of adverse effects on these valleys as a result of development actions in the future.

Conclusion. Removal of the Lehman Cave visitor center and parking lots and all NPS operational development from the park would greatly enhance views from various vantage points. Even with actions taken to ensure preservation of the visual integrity of the Spring Valley and Snake Valley basins, views across these basins would likely be compromised over time because of incompatible developments and land uses.

Cumulative Impacts. There would be no cumulative impacts on vistas as a result of this alternative.

Impacts on Floodplains and Wetlands

Analysis. Alternative B would remove the entire Lower Lehman Creek campground and the portion of the Grey Cliffs campground that is across the creek from the Baker Creek road. The Lower Lehman Creek campground would be removed because the high water table during the spring season causes wet and muddy conditions in some of the campsites. Approximately three-fourths of the Grey Cliffs campground would be removed to eliminate hazards from possible flash floods. A new campground would be built at Lehman Flats to replace the sites removed from the Lower Lehman Creek and Grey Cliffs campgrounds and to provide

some additional campsites. The site of the new campground would be well above Lehman Creek and out of its apparent floodplain.

The most significant effect on wetlands would result from the separation of grazing livestock from riparian areas and the wetlands associated with them. When the grazing management plan was completed and methods were instituted to separate livestock from these areas, conditions in riverine wetlands should greatly improve. However, as long as livestock continued to graze in the park, it is unlikely that they would ever be completely eliminated from wetlands.

Conclusion. This alternative would have beneficial effects on wetlands and would remove the campgrounds with the highest risk for human life and safety from flooding. Domestic livestock grazing would continue to adversely affect the park's wetlands, but to a lesser extent than at present.

Cumulative Impacts. There would be no cumulative impacts to wetlands or floodplains as a result of this alternative.

Impacts
on Soils

Analysis. The developments proposed under alternative B would cause approximately 73 acres of soil disturbance. Of this total, approximately 17 acres (23 percent) would be on land administered by the Bureau of Land Management, 5 acres (7 percent) on land administered by the Forest Service, and 51 acres (70 percent) on land within the park or on the Baker administrative site. Most of the soil disturbance would result from construction of campgrounds and facilities at the Baker site, with lesser amounts resulting from construction or rehabilitation of trails, roads, sewage treatment facilities, and other developments. An estimated 35.7 acres of previously disturbed soils would be rehabilitated and revegetated. Most of the new soil disturbance would be in the pinyon-juniper vegetation type. Lesser amounts of disturbance would occur in shadscale, mixed conifer, aspen, and other types.

The grazing management actions proposed in this alternative would reduce the potential for soil erosion in areas above 10,500 feet elevation and in riparian areas. Proposals to minimize grazing impacts in riparian areas might result in increased soil impacts elsewhere. For example, relocating cattle from streambanks to hillsides would result in decreased soil erosion in riparian areas and a corresponding increase in soil erosion on hillsides.

Conclusion. Approximately 73 acres of soils would be disturbed by developments proposed under this alternative.

and approximately 36 acres of previously disturbed soils would be rehabilitated and revegetated. This would result in a net impact on 37 acres of soils. Most of this impact would be on land within the park and would be associated with the proposed Lehman Flats campground; there would also be considerable impact at the Baker site. Grazing would continue to contribute to soil erosion, but this alternative would minimize soil erosion above 10,500 feet elevation and in riparian areas.

Cumulative Impacts. Over time, domestic livestock grazing would continue to cause some soil erosion. To a lesser degree, recreational activities such as hiking and horseback riding, which would likely increase under this alternative, would also cause minor amounts of soil erosion along trail corridors.

Analysis. Alternative B would establish a more systematic and comprehensive program for the preservation, protection, and interpretation of cultural resources in Great Basin National Park. It would provide for the preservation of cultural resources illustrating the history of the area and for additional efforts directed at management of the park's cultural resources. The three National Register sites - the Lehman orchard, Lehman aqueduct, and Rhodes cabin - and the Osceola ditch would receive preservation/stabilization treatment. The Johnson mill and mine would be evaluated, and appropriate treatment specified based on their National Register eligibility. Additional properties meeting National Register criteria would be nominated. Other sites would be left to deteriorate naturally, consistent with visitor safety requirements and the provisions of federal historic preservation laws and NPS management policies. Some significant archeological resources would be affected by proposed developments at the Baker guard station. However, in consultation with the state historic preservation officer, archeological testing would be carried out in an effort to avoid or reduce potential adverse impacts. The impacts of new development in the archeological zone at the Lehman Flats campground would also require consultation with the state historic preservation officer.

Conclusion. This alternative would generally improve the preservation, protection, and interpretation of significant cultural resources in the park.

Cumulative Impacts. Although this alternative would result in some adverse impacts on archeological zones in the park, the cumulative impacts on a regional scale would be

CULTURAL
RESOURCES

minimal. There would be no cumulative impacts on historic resources.

SOCIOECONOMIC ENVIRONMENT

Impacts on Livestock Grazing Permittees

Analysis. Alternative B would have moderate effects on grazing permittees, primarily by requiring them to keep tighter control on the movements of their stock and limiting the areas that stock could use for forage. Some of the campgrounds and visitor use areas would be fenced, but it is unlikely that all sensitive areas (riparian areas, Bonneville cutthroat habitat, subalpine meadows, and areas above 10,500 feet) would be fenced or otherwise barricaded to keep domestic stock out. This would place a greater burden on permittees to ensure that grazing livestock did not enter these areas.

Conclusion. Grazing permittees would be assured the continued availability of the grazing allotments in the park. However, they would be required to restrict grazing livestock to certain locations to a greater extent than in the past.

Cumulative Impacts. No cumulative effects on grazing permittees would result from this alternative.

Impacts on Mineral Interests

Analysis. Mining claimants within the park boundary would have to submit plans of operations for review and approval by the park superintendent before initiating any work related to mining. Before such plans were approved, the Park Service would conduct validity examinations on all claims. This would have two major effects on the claimants. First, there would be a delay in review and approval of any plan of operations that was submitted. This delay could be as long as one to two years. Second, if it was determined that a claim was invalid, the Bureau of Land Management would initiate procedures to extinguish it. The decision to extinguish a claim would be subject to appeal.

Mining operations cannot be denied without compensation on a valid mining claim with an approvable plan of operations. If a claim was determined to be valid, then the Park Service would have to decide whether to allow operations under an approved plan or to purchase the claim at fair market value. For most claims, especially those in the area surrounding Mt. Washington, the decision would be to purchase. NPS purchase of mining claims would eliminate the possibility of future mining and mineral exploration in those areas.

Owners of patented and valid unpatented mining claims outside the park boundary in the Mt. Washington area would be affected by the proposal to expand the boundary in the "keyhole" area and add approximately 1,850 acres to the

park. The impacts on these owners are described in the "Impacts on Residents and Private Property Owners" section.

Conclusion. The owners of mining claims within the park could be substantially affected if their claims were determined to be valid and they wished to mine; however, the Park Service would be required to purchase any valid claims on which it denied approval of the plans of operations. It is probable that the vast majority of these claims are invalid and would never be mined. Therefore, the economic impacts on mineral interests would be minimal for the foreseeable future.

Cumulative Impacts. Unless there is a major unknown mineral deposit in the park, the cumulative impacts of this alternative would be negligible.

Analysis. The 15 to 20 private homeowners who live along the existing entrance road could expect slightly increased traffic, traffic noise, and potential for traffic accidents as a result of proposals in alternative B. This could detract from the quality of life for these residents.

Impacts on Residents and Private Property Owners

All of the patented and valid unpatented claims on the 1,850-acre parcel near Mt. Washington would be acquired as part of the boundary expansion proposed in alternative B. Landowners would initially be approached on a willing-seller basis. In the event this approach was unsuccessful, Congress would have to amend the park's establishing legislation to allow condemnation in acquiring these lands. In either case, landowners would receive fair market value. NPS purchase of these mining claims would eliminate the possibility of future mining and mineral exploration in the "keyhole" area.

Other owners of property adjacent to the park boundary and close to exceptional resources within the park could expect concern from the Park Service and public about any development, activity, or proposed activity that threatened exceptional resources. In such an event, the Park Service would work with the property owner and local, county, and state governments to ensure protection of resource values.

Conclusion. Most surrounding landowners would experience few changes with the implementation of alternative B. Residents along the existing entrance road would notice slightly more traffic and traffic noise. Landowners in the Mt. Washington boundary expansion area would have their land acquired at fair market value. Other landowners adjacent to exceptional resources in the park might be prevented from

developing their land because of Park Service efforts to protect those resources.

Cumulative impacts. There would be no cumulative impacts on private landowners as a result of alternative B.

Impacts on the Regional Economy

Analysis. Alternative B would have the following effects on the regional economy.

Construction - Alternative B would generate \$25,300,000 (net) in construction projects. These projects would provide short-term benefits and would not result in permanent jobs or long-term economic growth. If regional firms were selected for all construction projects, total business activity would increase by \$36,900,000. This would result in the equivalent of 400 full-time jobs and \$15,700,000 in personal income and taxes. If firms outside the region were selected, total business activity would increase by \$24,800,000, creating 242 full-time equivalent jobs and \$10,100,000 in personal income and taxes. Actual economic benefits would fall somewhere between the two scenarios.

Operating Budget - Expenditures from the park's operating budget would increase by \$657,000. This would increase annual expenditures to regional firms by \$454,000 and total economic output by \$784,000, creating an additional 27 full-time equivalent jobs and \$634,000 in personal income and business taxes.

Visitor Expenditures - Visitor use is expected to stabilize at about 78,000 visits per year. This level of visitation would increase visitor spending by \$91,000, resulting in an additional \$125,000 in total regional business activity, the equivalent of 3 full-time jobs, and \$61,000 in personal income and business taxes. If the private sector marketed the park and expanded visitor services to capture more visitor clientele, the length of stay and per-party expenditures could double, with a resulting increase in visitor spending by \$1,695,000. This level of visitor spending would generate \$2,349,000 for regional businesses, 57 full-time equivalent jobs, and \$1,135,000 in personal income and business taxes.

Conclusion. Alternative B would have a relatively small but positive impact on the regional economy.

Cumulative impacts. There would be no significant cumulative impacts on the regional economy as a result of this alternative.

TABLE 17: SUMMARY OF IMPACTS ON THE REGIONAL ECONOMY - ALTERNATIVE B

Construction Expenditures (1990 dollars)

	Total Costs (\$MM)	Total Business Activity (\$MM)	Personal Income and Business Taxes (\$MM)	Total Jobs (FTE)
Pre-Park	0	0	0	0
Existing	0	0	0	0
Future	25.3	36.9	15.7	400
Region	25.3	24.8	10.1	242
Nonregion				

Operating Budget Expenditures (1990 dollars)

	Total Budget (\$000)	Regional Purchases (\$000)	Total Business Activity (\$000)	Personal Income and Business Taxes (\$000)	Total Jobs (FTE)
Pre-Park	256	170	302	230	10
Existing	1,310	874	1,487	1,124	46
Future	1,962	1,328	2,271	1,758	73

Visitor Expenditures (1990 dollars)

	Total Expenditures (\$000)	Total Business Activity (\$000)	Personal Income and Business Taxes (\$000)	Total Jobs (FTE)
Pre-Park	746	1,028	497	25
Existing	1,513	2,099	1,013	51
Future	1,604	2,224	1,074	54
Stable				
Enhanced	3,208	4,448	2,148	108

Impacts on Local Visitors

Analysis. Camping, picnicking, hiking, horseback riding, and many other activities previously enjoyed by local visitors would continue to be available in the park. However, hunting, tree cutting, unrestricted four-wheel driving, camping in undesignated sites along roads, trapping, commercial harvesting of pinyon nuts, prospecting, and collecting minerals, plants, and animals would no longer be allowed. Policies prohibiting or closely regulating these and similar uses would adversely affect local visitors who have traditionally participated in these activities. These effects would be partially mitigated by the fact that other public lands are available in the area where consumptive uses are permitted.

Local visitors might also object to the increasing number of other visitors that the national park attracts. There would be increased competition for campsites, more crowding at popular visitor attractions, more hikers on backcountry trails, and generally reduced opportunities for solitude.

Conclusion. The park would continue to provide opportunities for nonconsumptive recreational activities by local visitors; however, some of these activities would be more closely regulated than in the past. Some consumptive uses would be prohibited or allowed only under permit.

Cumulative Impacts. The state of Nevada and the area surrounding the park have a vast amount of public land where consumptive uses and unregulated recreational activities can take place. Therefore, the cumulative impacts on local visitors would be minimal.

Impacts on Other Visitors

Analysis. Because alternative B would emphasize resource protection and would reduce developments inside the park to a minimum, it would best serve people seeking more primitive experiences. All major developments would be in the northern part of the park, and except for Lexington Arch, areas south of Snake Creek would be trailless. Existing attractions at Lehman Cave and Wheeler Peak would still be easily accessible, but the remainder of the park would be reserved for backcountry travelers.

Although the visitor center in Baker would provide interpretation of the Great Basin region, its location near a small commercial and residential area and at the intersection of two main roads would contribute little to the visitor experience. There would be no viewing deck at the facility, and views of the park and the basin environment would be limited. Some interpretive and recreational facilities would be provided in the park. Existing interpretive pullouts along the

Wheeler Peak road would be upgraded, and one new pullout would be established along the park entrance road. Camping opportunities, although limited, would be available along the Wheeler Peak road and in Strawberry Creek and Baker Creek. Rehabilitated trails would permit access into large portions of the park's backcountry.

Several actions would reduce potential safety hazards or eliminate undesirable conditions. Shoulder widening and road stabilization would improve safety and accessibility at points of interest along the Wheeler Peak road. Relocation of the Wheeler Peak pullout/trailhead would reduce congestion and pedestrian hazards at the existing trailhead parking area. Eliminating a portion of the Grey Cliffs campground would reduce potential safety hazards there in the event of flash flood. Removing equipment and hazardous materials from mines and stabilizing mine shafts would increase safety for backcountry users.

Prohibiting oversized vehicles and RVs from traveling up the Wheeler Peak road beyond Lehman Curve would inconvenience visitors in such vehicles who had no alternate means of transportation. However, this prohibition would improve safety for other motorists using the road.

Conclusion. This alternative would best serve visitors wanting to explore the park's backcountry. Information, orientation, and interpretive services would be provided at the new visitor center in Baker, and the Lehman Cave/Wheeler Peak area would be maintained for relatively intensive use. The remainder of the park would be reserved for rustic and primitive experiences and would be managed to ensure maximum resource protection.

Cumulative Impacts. There would be no cumulative impacts on visitors as a result of this alternative.

Analysis. Moderate increases (above 1989 staffing and funding levels) in law enforcement and resource management personnel and funding would be required to

handle the 20 to 25 percent increase in visitation that is projected over the next 10 years

expand opportunities in the Strawberry Creek and Lexington Arch portions of the park

monitor increasing backcountry use (approximately 56 miles of trails would be designated and maintained as

MANAGEMENT

Impacts on
Park
Management
and
Operations

ALTERNATIVE B - BACKCOUNTRY EMPHASIS

compared to the 20 miles of currently maintained backcountry trails)

monitor the more remote locations along the park's western boundary

implement the management zoning system and monitor activities

implement and administer the grazing management plan, fire management plan, and cave management plan.

Substantial increases in maintenance personnel and funding would be required to repair, upgrade, and maintain the expanded backcountry trail system, the new 100-site Lehman Flats campground, the Lehman Cave ticket sales kiosk/staging shelter, four regional highway exhibit shelters, and 20 additional miles of access roads outside the park boundary. There would be slight increases in travel time (10 minutes) for maintenance workers to get from the proposed maintenance area to the park's main developed area at Lehman Cave. From the proposed maintenance area, workers would have slightly shorter distances to travel to reach other visitor use areas, including Lexington Arch, Snake Creek, and Strawberry Creek.

Slight increases in interpretive personnel and funding would be needed to support the modest expansion of interpretive programs in the Wheeler Peak day use area.

Additional administrative personnel would be needed to manage the 35 percent increase in park staff and associated increases in purchasing needs.

The impacts of relocating most park housing to the Baker administrative site would be similar to those of the proposed action. Contacts and opportunities for social interaction between employees and Baker community residents would increase, while similar contacts with current park neighbors would decrease. Park employees would be closer to Baker services but farther from recreational opportunities in the park. Cooling costs would be higher; these costs would be partially mitigated by including efficient insulation and heating/cooling devices in the new housing units. Commuting time for employees working in the park would increase to about 10 minutes.

Analysis. This alternative would add approximately 1,850 acres of Forest Service land west of the park near Mt. Washington and eliminate the "keyhole" in the boundary. This area, which includes the western approaches to Mt. Washington and consists of extremely steep terrain on the upper slopes of the Snake Range, has historically been used for mining. It contains ten patented and numerous unpatented mining claims. The effect of this action on the Forest Service would be to reduce its administrative responsibilities related to mining in an area where mining claims cover most of the land.

Impacts on
U.S. Forest
Service and
Bureau
of Land
Management
Operations

This alternative also proposes upgrading and establishing rights-of-way along several existing roads that cross Forest Service and Bureau of Land Management land before reaching the park. The following table indicates the lengths of roads and the amount of land that would be involved in the rights-of-way.

TABLE 18: PROPOSED RIGHTS-OF-WAY THROUGH USFS AND BLM LAND - ALTERNATIVE B

	Approximate Mileage through USFS Land	Approximate Acres of Proposed Right-of-Way	Approximate Mileage through BLM Land	Approximate Acreage of Proposed Right-of-Way
Strawberry Creek Road	0.5	25	2.2	106
Snake Creek Road	1.3	65	4.2	204
Lexington Arch Road	3.8	190	7.7	373

When the Park Service assumed responsibility for maintenance on these roads, the Forest Service and Bureau of Land Management would no longer have to spend time and funds to maintain them and could use maintenance resources elsewhere. Both agencies would use these roads for the management of lands adjacent to NPS rights-of-way. Lands within the rights-of-way would still be available for traditional uses, including recreation, grazing, developments, and public and private uses, as long as they did not cause visual intrusions on the rights-of-way.

Conclusion. There would be few impacts on the Forest Service and Bureau of Land Management as a result of this alternative. Land transfers and NPS rights-of-way would increase the overall efficiency of public land administration in the Great Basin region.

Cumulative Impacts. There would be no known cumulative impacts on the Forest Service or the Bureau of Land Management as a result of the proposed action.

ALTERNATIVE C - ACCESS EMPHASIS

BIOLOGICAL AND PHYSICAL RESOURCES

Impacts on
Bristlecone
Pine Forests

Analysis. Reconstruction and improvement of the trail system through the bristlecone pine stand in the Wheeler Peak semi-primitive day use subzone would provide additional definition to the trail tread, thereby protecting the pines from additional soil compaction and trampling caused by off-trail use and the lack of a continuous protective trail tread near their roots.

Actions to provide for public vehicular access to Mt. Washington and hiking through the bristlecone pine stand there would to some degree jeopardize the pines by increasing visitation but would also alleviate some existing adverse impacts caused by uncontrolled access and lack of enforcement personnel in the area. Direct and indirect impacts would include damage to the trees, roots, seedlings, and surrounding soils and the potential for vandalism or inadvertent physical damage to individual trees. An NPS presence would be established in the area to reduce or mitigate these impacts. None of the bristlecone stands in the park would receive the additional protection of zoning and management as protected or research natural areas. Because of this and because relatively intensive use would be encouraged, the potential for additional visitor impacts on bristlecones would increase. In addition, livestock grazing would continue to pose threats to these significant resources.

Conclusion. This alternative would provide for increased access to the Mt. Washington bristlecone pine stand, which could have additional impacts on this resource. Ranger personnel would be assigned to the area to reduce or mitigate these impacts. None of the bristlecone stands in the park would receive the additional protection of restrictive management zoning.

Cumulative Impacts. Improving access to the Mt. Washington bristlecone stand could have a negative cumulative impact over time on the bristlecone pine population in the national park system.

Impacts on
Riparian
Areas and
Water
Quality

Analysis. The impacts on riparian areas would be similar to those of the proposed action. Livestock grazing would continue to have adverse effects in the short term, primarily because of the reduction of vegetation along stream corridors but also as a result of soil compaction and erosion from trampling, the introduction of nonnative plant species, and the alteration of natural species composition in plant

communities. Water quality in the riparian streams would also continue to be adversely affected through physical/chemical modification caused directly or indirectly by livestock.

When the grazing management plan was completed and methods were devised for effectively separating grazing livestock from riparian areas, conditions in these areas should improve. However, as long as livestock continued to graze in the park, it is unlikely that they would ever be completely eliminated from riparian areas. Methods to separate livestock from riparian areas might also result in additional grazing impacts on vegetation and soils on the open slopes above riparian areas.

This alternative would remove the Lower Lehman Creek campground and the portion of the Gray Cliffs campground that is in the riparian area of Baker Creek. Removal of a total of 51 campsites along about 600 linear feet of Baker Creek and 200 linear feet of Lehman Creek would eliminate direct and indirect human impacts on approximately 2 acres of riparian lands. The new eastern extension of Wheeler Peak Scenic Drive would cross the riparian portion of Baker Creek just east of the proposed eastern park boundary. Where the road crossed the creek, construction would destroy approximately 1/4 acre of riparian vegetation and habitat. The proposed spur road from Wheeler Peak Scenic Drive to the new parking area at Lehman Cave would cross Lehman Creek about 3/4 of a mile inside the park boundary. Because Lehman Creek is quite narrow in this area (less than 30 feet across) and the banks on either side are fairly high, less than 1/10 of an acre of riparian vegetation and habitat would be destroyed.

There would be no adverse effects on the wild and scenic river values of the South Fork of Big Wash.

Conclusion. Domestic livestock grazing would continue to be the major man-caused adverse effect on riparian vegetation and habitat. Future conditions in riparian areas should improve as a result of methods employed to separate livestock from these areas. However, as long as domestic livestock grazing continued, riparian areas would be adversely affected. Approximately 1 1/2 acres of riparian habitat would be removed under this alternative, and 2 acres of currently disturbed riparian lands would be restored.

Cumulative Impacts. Because of the apparent damage in many of the riparian areas in the region, any improvement in riparian habitat in the park would have a positive cumulative impact on riparian areas on a local and regional scale.

Impacts on
Alpine/
Subalpine
Areas

Analysis. A probable consequence of improving access to the area around Mt. Washington would be increased random foot travel in surrounding alpine and subalpine areas. This would result in some direct adverse impacts on vegetation in these areas. All other vehicular access to alpine and subalpine areas would be eliminated, and existing access roads and routes would be rehabilitated. These actions would have beneficial effects on the overall appearance and ecological conditions of alpine and subalpine communities.

Developments proposed in alpine and subalpine areas, including trails and backcountry shelters, an improved 4-wheel drive road, a ranger station, and a parking lot, trailhead, and associated interpretive trail near the summit of Mt. Washington, would result in some direct adverse impacts on approximately 5 acres of alpine and subalpine vegetation.

The known rare and sensitive alpine and subalpine plant species are generally in areas of relatively sparse vegetation that are rarely subject to domestic livestock grazing. However, because this alternative would not zone alpine and subalpine lands as protected natural areas, some grazing would continue to occur there, possibly causing impacts on rare and sensitive species.

Conclusion. This alternative could have a high level of impact on alpine and subalpine communities. Opening the Mt. Washington area to vehicular access and providing developments in other high country areas could disturb or damage these communities and individual species within them. Domestic livestock grazing could adversely affect rare and sensitive plant species.

Cumulative Impacts. Because there are few other mountain ranges in the region with large areas of alpine and subalpine vegetation, the actions taken in this alternative could have a substantial negative cumulative effect on a regional scale over time.

Impacts on
Rare and
Sensitive
Plant
Species

Analysis. Alternative C would have the following impacts on rare and sensitive species.

Impacts from Domestic Livestock Grazing – The majority of the park's rare and sensitive plant species inhabit areas above 10,500 feet in elevation and depend on the

alpine/subalpine habitat. Under this alternative domestic livestock grazing would continue to be allowed in all high elevation areas, which could have adverse effects on species in some locations.

Lower elevations rare and sensitive plants species would receive additional protection under this alternative because of methods instituted to separate grazing livestock from such species.

Impacts from Mining – Impacts on rare and sensitive plant species could result from direct excavation, creation of spoil areas, machine operation, and other mining activities. Before approving any claimant's proposed plan of operation, the Park Service would evaluate the area for the presence of such species.

Impacts from Recreational Use – This alternative would provide additional park access near Mt. Washington, which is at the heart of the habitat for most of rare and sensitive species that are candidates for listing under the Endangered Species Act. Although many of these species would be protected from human impacts by their rocky cliff habitats, increased visitor use around Mt. Washington could jeopardize some species because of inadvertent trampling and illegal collecting.

Under this alternative five backcountry trails would built or upgraded in alpine and subalpine areas. Trail construction in these areas would remove less than 5 acres of potential habitat for rare and sensitive plant species. During trail planning and construction, the Park Service would identify and avoid all areas where such plants exist. Trail corridors would be less than 6 feet wide. Because visitors would tend to concentrate along trail corridors, the impacts on individual plants and their communities caused by random cross-country travel would be reduced by constructing or improving trails.

Conclusion. Rare and sensitive plants would receive limited protection under this alternative. Increased visitor use would threaten the habitat of these species around Mt. Washington. Domestic livestock grazing, mining, and trail construction activities also have the potential to impact these species.

Cumulative Impacts. Many of the rare and sensitive species in the alpine and subalpine communities of the park are found in few other locations. In many cases a few individual plants are scattered over a wide area. Therefore, seemingly minor impacts to individual plants, like those caused by

ALTERNATIVE C - ACCESS EMPHASIS

visitor use and domestic livestock grazing, could have serious adverse effects on some of these species. Although it is unlikely that grazing could affect an entire species to the point of extinction over time some individual habitats could be adversely affected and some species eliminated.

Impacts on Peregrine Falcons

Analysis. This alternative proposes an improved road, visitor contact station, two parking lots, a housing and maintenance area, and an interpretive trail in the peregrine falcon recovery area southwest of Mt. Washington. These developments and the resulting increased human presence could disturb peregrine falcons and potentially interrupt nesting activities. The Park Service would actively work to reestablish the peregrine falcon in the South Snake Range in cooperation with the Forest Service, the Peregrine Fund, and the Nevada Department of Wildlife.

Conclusion. Peregrine falcon habitat would be adversely affected by actions taken in this alternative. Active NPS involvement in the peregrine recovery effort would help to reestablish this species in the park and surrounding region.

Cumulative Impacts. Proposed developments and human use on the southwestern slope of Mt. Washington could decrease the chances for successful reestablishment of peregrine falcons in the South Snake Range. On a national scale the cumulative impacts would be minor. On a regional scale these impacts could be serious.

Impacts on Bonneville Cutthroat Trout

Analysis. Although domestic livestock would continue to be permitted in the Pine and Ridge creek watersheds, the Park Service would provide additional protection for the existing populations of Bonneville cutthroat trout in these areas through management techniques to separate grazing livestock from the creeks. These actions would reduce or eliminate most of the adverse effects of past sheep grazing, including reducing vegetative cover, eroding stream banks, and directly affecting water quality through fecal contamination and trampling.

Reintroducing this trout into all east side waters would greatly expand their range and help protect the trout by establishing numerous separate populations, thus lessening the probability of a single event such as a flood eliminating the trout from the South Snake Range.

Conclusion. This alternative would improve the integrity of existing trout habitat and would increase protection for the population as a whole by reintroducing trout on the east side of the park.

Cumulative Impacts. Because of the scarceness of pure populations of Bonneville cutthroat trout on a regional scale, establishing additional populations within their historic range would have an important beneficial cumulative effect on their recovery and preservation.

Analysis. Identified threats to the biological diversity of the park include invasion of native plant habitats by competitive nonnative species; disturbance and alteration of natural plant communities by domestic livestock grazing, mining, ground-disturbing developments, and human use; development of overly mature plant communities because of the suppression of natural fires; and climatic changes resulting from environmental factors. Alternative C would have only minor effects in reducing these threats except for those associated with fire suppression. A rangeland rotation system would be established to help decrease the impacts of grazing on the park's biological diversity. Mining impacts would be controlled through the review and approval process for plans of operations. Rare and sensitive plant communities would be avoided during trail and campsite planning and construction. A fire management plan would be developed with prescriptions for allowing natural fires to burn within the park to help ensure a heterogeneous natural landscape with diverse habitats.

The one area where actions might have negative effects on biological diversity is the proposed Mt. Washington semi-primitive day use area, where some rare and sensitive species could be jeopardized because of increased visitor use.

Conclusion. There would be limited effects on biological diversity within the park as a result of this alternative. Grazing would continue to affect natural vegetation diversity; however, management methods would be employed to encourage stock to graze in areas with less sensitive resources, thus reducing the present impacts of grazing in some areas. Visitor impacts would increase in the Mt. Washington area, potentially jeopardizing a number of rare and sensitive plants. Prescriptions for allowing natural fires to burn would have a positive effect in ensuring natural biological diversity.

Cumulative Impacts. There would be no cumulative impacts on biological diversity as a result of this alternative.

Analysis. Under this alternative several developments would be constructed on or near areas with the potential for underlying caves. These include the proposed Great Basin

Impacts on Biological Diversity

Impacts on Caves

visitor center, short sections of the proposed Wheeler Peak Scenic Drive, and the additional water storage structures near Cave Spring. Before constructing these facilities, the Park Service would perform seismic investigations to determine if caves were present in the underlying substrate and if so where. This information would be used to develop mitigating measures to eliminate the possibility of adversely affecting caves. If caves were determined to be near the surface and if it could not be assured that the proposed developments would not affect natural cave conditions, including percolation and subsurface water movements, developments would be planned and built elsewhere.

The Great Basin visitor center would be designed to minimally impact the land by sitting lightly on limestone substrate. Because of the presence of numerous caves in this substrate, the Park Service would conduct a geotechnical investigation to determine the bearing capacity of the substrate and to assure that construction would not impact unknown cave systems. Two possible types of construction include slab on grade or pole type. (The maximum depth of excavation needed for the grade beam would be 2 feet. The depth of excavation required to support pole-type structures could be greater than two feet.) Electrical and water system connections would involve extension of existing systems from the existing park housing area. These systems would be incorporated into conduit buried beneath existing and proposed roads to minimize additional damage. The footprint of the building would be kept to a minimum.

Several existing structures would be removed from areas with the potential for underlying caves, including four buildings and the boneyard in the existing maintenance area, the lower parking lot at the Lehman Cave interpretive center, the existing park entrance road near Lehman Cave, and approximately three-fourths of the Grey Cliffs campground. Removal of these developments would restore more natural water infiltration to these areas and eliminate the possibility of future maintenance or reconstruction activities adversely affecting any caves.

No actions would be undertaken that would adversely affect Lehman Cave.

Conclusion. This alternative would involve construction of more new facilities on areas with the potential for underlying caves than would be removed. No adverse effects on cave resources are anticipated.

Cumulative Impacts. The cumulative impacts of this alternative would be minor on a regional and national scale.

Analysis. No significant adverse impacts on air quality would result from implementation of this alternative. Additional visitation and related automobile traffic could cause slight increases in automobile emissions on and near park roads. Dust levels are high at times because of high winds and arid conditions, particularly along the Baker Creek road. This road and the Snake Creek road would be paved under alternative C, but other unpaved roads would likely receive more traffic and experience temporary increases in dust when winds were high.

Impacts
on Air
Quality

Building and utility construction would result in temporary localized increases in particulates. Machinery emissions and increased airborne dust from construction activities would decrease air quality in the vicinity of the project sites. Normal conditions would return when construction was completed.

Any prescribed burning in the park would result in temporary decreases in air quality. The Park Service would work with Nevada state agencies to minimize any adverse effects.

Conclusion. The impacts on the park's air quality would be minor.

Cumulative Impacts. The proposed action would have no measurable cumulative effects on regional air quality.

Analysis. All existing developments except the sewage lagoons would remain in the park, and some new developments would be built on-site to meet increasing demands. Both existing and new developments would be visible from various vantage points in and around the park.

Impacts
on Vistas

The new administration building, new maintenance area, and expanded housing area would be visible from Wheeler Peak Scenic Drive and several vantage points on the east side of the park, which would adversely affect views in these areas.

Removing the lower parking lot and restricting use of the upper lot in front of the Lehman Cave interpretive center would substantially improve views of the portion of the northern Snake Valley that is visible from the front porch of the interpretive center. The proposed new parking area north of Lehman Cave would be visible from several vantage points in the park; however, the parking area would be

designed and laid out to use the surrounding pinyon forest to help screen and mitigate its impact on park vistas.

Although the proposed Great Basin visitor center would be inside the park at Kiou Basin, it would not be visible from most vantage points in the main visitor use area (the portion of Wheeler Peak Scenic Drive inside the park boundary, the Lehman Cave interpretive center, and hiking trails in the Baker and Lehman creek drainages). The large viewing deck at the visitor center would provide opportunities to view and experience a dramatic Great Basin scene, which would greatly enhance the story presentation in the visitor center film and exhibits.

The proposed eastern extension of Wheeler Peak Scenic Drive would be designed and constructed based on the results of a computer-generated analysis to minimize its resource impacts and its impacts on views from the new visitor center. However, because its alignment would pass through the Kiou Basin area, short segments of the road would be visible from the facility. The interpretive experiences associated with the new extension of Wheeler Peak Scenic Drive would offset the impacts of the road views from the visitor center. Terrain and vegetation would be used to the extent possible to block or screen views of traffic from the visitor center and from other areas of the park.

As in the proposed action, the Park Service would promote preservation of the visual integrity of the Spring and Snake valleys through the review and monitoring of development proposals in the region. However, there would still be a high probability of adverse effects on these valleys as a result of development actions in the future.

Conclusion. Retaining and expanding NPS administrative developments within the park would increase the intrusions on views from various vantage points in the main visitor use area. The Kiou Basin visitor center would be visible from the new Wheeler Peak Scenic Drive extension, but would not be visible from within the park; several segments of the scenic drive extension would intrude on views from the new visitor center. Even with actions taken to ensure preservation of the visual integrity of the Spring Valley and Snake Valley basins, views across these basins would likely be compromised over time because of incompatible developments and land uses.

Cumulative Impacts. There would be no cumulative impacts on vistas as a result of this alternative.

Analysis. Alternative C would remove the entire Lower Lehman Creek campground and the portion of the Grey Cliffs campground that is across the creek from the Baker Creek road. The Lower Lehman Creek campground would be removed because the high water table during the spring season causes wet and muddy conditions in some of the campsites. Approximately three-fourths of the Grey Cliffs campground would be removed to eliminate hazards from possible flash floods. A new campground would be built at Lehman Flats to replace the sites removed from the Lower Lehman Creek and Grey Cliffs campgrounds and to provide some additional campsites. The site of the new campground would be well above Lehman Creek and out of its apparent floodplain.

The proposed eastern extension of Wheeler Peak Scenic Drive would cross the apparent floodplain and riverine wetlands of Baker Creek outside the park boundary. The proposed road alignment would minimize the effects on the floodplain and streamside wetlands. The road would cross the creek at a 90 degree angle and would not parallel the creek on either side of the crossing. Because the wetlands are in a narrow corridor, the bridge would be of sufficient span to prevent any fill material from altering the wetlands or affecting the water flows on which they depend. The proposed spur road from Wheeler Peak Scenic Drive to the new Lehman Cave parking area would cross the floodplain of Lehman Creek and its streamside wetlands. Because the creek is quite narrow in this area and the banks are fairly high, it should be possible to build the road and bridge entirely outside the creek's apparent floodplain, with very little damage to associated wetlands.

The most significant effect on wetlands would result from the separation of grazing livestock from riparian areas and the wetlands associated with them. When the grazing management plan was completed and methods were instituted to separate livestock from these areas, conditions in riverine wetlands should greatly improve. However, as long as livestock continued to graze in the park, it is unlikely that they would ever be completely eliminated from wetlands.

Conclusion. This alternative would have beneficial effects on wetlands and would remove the campgrounds with the highest risk to human life and safety from flooding. Domestic livestock grazing would continue to adversely affect the park's wetlands, but to a lesser extent than at present.

Cumulative Impacts. There would be no cumulative impacts to wetlands or floodplains as a result of this alternative.

Impacts on
Floodplains
and
Wetlands

Impacts
on Soils

Analysis. The developments proposed under this alternative would cause approximately 183 acres of soil disturbance. Of this total, approximately 55 acres (30 percent) would be on land administered by the Bureau of Land Management, 17 acres (9 percent) on land administered by the Forest Service, and 111 acres (61 percent) on land within the park or on the Baker administrative site. Most of the soil disturbance would result from construction of roads and parking lots, with lesser amounts resulting from construction or rehabilitation of buildings, trails, campgrounds, sewage treatment facilities, and other developments. An estimated 21 acres of previously disturbed soils would be rehabilitated and revegetated. The grazing management actions proposed under this alternative would probably result in little change in the potential for soil erosion.

Conclusion. Approximately 183 acres would be disturbed under this alternative, and approximately 21 acres of previously disturbed soils would be rehabilitated and revegetated. Thus, there would be a net impact on 162 acres of soils. Most of this impact would be on land outside the park boundary and would be associated with proposed roads or structures on BLM land. Grazing would continue to contribute to soil erosion.

Cumulative Impacts. Over time, domestic livestock grazing would continue to cause some soil erosion. To a lesser degree, recreational activities such as hiking and horseback riding, which would likely increase under this alternative, would also cause minor amounts of soil erosion along trail corridors.

CULTURAL
RESOURCES

Analysis. Alternative C would establish a more systematic and comprehensive program for the preservation, protection, and interpretation of cultural resources in Great Basin National Park. It would provide for the preservation of cultural resources illustrating the history of the area and for additional efforts directed at management of the park's cultural resources. The three National Register sites – the Lehman orchard, Lehman aqueduct, and Rhodes cabin – and the Osceola ditch would receive preservation/stabilization treatment. The Johnson mill and mine would be evaluated, and appropriate treatment specified based on their National Register eligibility. Additional properties meeting National Register criteria would be nominated. Other sites would be left to deteriorate naturally, consistent with visitor safety requirements and the provisions of federal historic preservation laws and NPS management policies. Because the orientation center would be the only park facility built on the Baker guard station site, it is likely that it could be

located to avoid any adverse effects on significant archeological resources on the site. In consultation with the state historic preservation officer, testing would be carried out at the Lehman Flats campground and along the Lehman Cave spur road to avoid, minimize, or mitigate effects.

Conclusion. This alternative would generally improve the preservation, protection, and interpretation of significant cultural resources in the park.

Cumulative Impacts. Although this alternative would result in limited adverse impacts on archeological zones in the park, the cumulative impacts on a regional scale would be minimal. There would be no cumulative impacts on historic resources.

Analysis. Alternative C would have moderate effects on grazing permittees, primarily by requiring them to keep tighter control on the movements of their stock and limiting the areas that stock could use for forage. Some of the campgrounds and visitor use areas would be fenced, but it is unlikely that all sensitive areas (riparian areas, Bonneville cutthroat habitat, and subalpine meadows) would be fenced or otherwise barricaded to keep domestic stock out. This would place a greater burden on permittees to ensure that grazing livestock did not enter these areas.

Conclusion. Grazing permittees would be assured the continued availability of the grazing allotments in the park. However, they would be required to restrict grazing livestock to certain locations to a greater extent than in the past.

Cumulative Impacts. No cumulative effects on grazing permittees would result from this alternative.

Analysis. Mining claimants within the park boundary would have to submit plans of operations for review and approval by the park superintendent before initiating any work related to mining. Before such plans were approved, the Park Service would conduct validity examinations on all claims. This would have two major effects on the claimants. First, there would be a delay in review and approval of any plan of operations that was submitted. This delay could be as long as one to two years. Second, if it was determined that a claim was invalid, the Bureau of Land Management would initiate procedures to extinguish it. The decision to extinguish a claim would be subject to appeal.

Mining operations cannot be denied without compensation on a valid mining claim with an approvable plan of operations. If

SOCIOECONOMIC
ENVIRONMENTImpacts on
Livestock
Grazing
PermitteesImpacts on
Mineral
Interests

a claim was determined to be valid, the Park Service would have to decide whether to allow operations under an approved plan or to purchase the claim at fair market value. For most claims, especially those in the area surrounding Mt. Washington, the decision would be to purchase. NPS purchase of mining claims would eliminate the possibility of future mining and mineral exploration in those areas.

Owners of patented or valid unpatented mining claims outside the boundary who required access across park lands to mine their claims would also have to submit plans of operations for approval by the Park Service. If the Park Service decided not to approve a plan for a patented mining claim, it would have to purchase the property at its appraised value.

Conclusion. The owners of mining claims within the park could be substantially affected if their claims were determined to be valid and they wished to mine; however, the Park Service would be required to purchase any valid claims on which it denied approval of the plans of operations. It is probable that the vast majority of these claims are invalid and would never be mined. Therefore, the economic impacts on mineral interests would be minimal for the foreseeable future.

Cumulative Impacts. Unless there is a major unknown mineral deposit in the park, the cumulative impacts of this alternative would be negligible.

Impacts on
Residents
and
Private
Property
Owners

Analysis. Private homeowners along the existing entrance road would benefit from the increased privacy afforded by relocating visitor traffic to the new Wheeler Peak Scenic Drive. After the scenic drive was opened, traffic volumes along the existing entrance road would decrease dramatically, reducing noise levels and improving safety for residents.

Relocating the park entrance about 2 miles south of the existing entrance on Nevada Highway 487 would not adversely affect commercial interests in Baker. The majority of visitors would still arrive from the north and drive through town to reach the park; however, instead of turning onto the park entrance road in the middle of town, they would pass through the entire town.

The homeowners who live just south of Baker adjacent to Highway 487 would notice substantial increases in traffic volumes and noise levels when the scenic drive was

opened. The potential for traffic accidents along this portion of the highway would also increase.

Because of overall increases in park visitation and because this alternative would increase developments in both the northern and southern parts of the park, Baker residents and property owners would come into contact with visitors much more frequently. Some might view increased visitation as an economic benefit; others may view it as an intrusion or an invasion of privacy.

Baker residents would have a slightly longer travel distance to the park boundary as a result of the proposed action. Most residents can now reach the park boundary in 10 minutes or less. The proposed action would increase their travel time by another 10 to 20 minutes, depending on their originating point.

Owners of property adjacent to the park boundary and close to exceptional resources within the park could expect concern from the Park Service and the public about any development, activity, or proposed activity that threatened resource values. In such an event, the Park Service would work with the property owner and local, county, and state governments to ensure protection of resource values.

Conclusion. The majority of residents and landowners in the Baker vicinity would benefit from the proposed Wheeler Peak Scenic Drive. The reduction in traffic volumes and noise levels along the existing entrance road would improve the quality of life for residents along that road. In addition, the new park entrance would route most visitors all the way through the commercial center of Baker. Overall, residents and landowners would have more frequent contacts with visitors. Some landowners with properties adjacent to exceptional resources in the park might be prevented from developing their land because of Park Service efforts to protect those resources.

Cumulative Impacts. There would be no cumulative impacts on residents and private landowners as a result of the proposed action.

Analysis. Alternative C would have the following effects on the regional economy.

Construction - This alternative would generate \$34,700,000 (net) in construction projects. These projects would provide short-term benefits and would result in no permanent jobs or

Impacts on
the
Regional
Economy

long-term economic growth. If all projects were awarded to firms in the region, total business activity would increase by \$50,800,000, resulting in an additional 533 full-time equivalent jobs and \$21,500,000 in personal income and business taxes. If nonregional firms were used for all projects, total economic output would increase by \$34,200,000, creating 322 in full-time equivalent jobs and \$13,900,000 in personal income and taxes.

Operating Budget – Alternative C would increase the park's operating budget by \$921,000. Annual expenditures to regional businesses would increase by \$641,000, resulting in an increase of \$1,180,000 in total business activity, 41 full-time equivalent jobs, and \$952,000 in personal income and business taxes.

Visitor Expenditures – Under this alternative, visitor use of the park is expected to stabilize at about 78,000 visits per year. This level of visitation would increase visitor spending by \$91,000, resulting in an additional \$125,000 in total regional business activity, the equivalent of 3 full-time jobs, and \$61,000 in personal income and business taxes. If the private sector marketed the park as a unique recreational opportunity and expanded visitor services outside the park to capture more visitor clientele, the length of stay and per-party expenditures would likely increase in the area. For the purposes of this analysis, it is reasonable to assume that such activities could double the average length of stay and/or expenditures with a resulting increase in visitor spending by \$1,695,000. This level of visitor spending would generate \$2,349,000 for regional businesses, 57 full-time equivalent jobs, and \$1,135,000 in personal income and business taxes.

Conclusion. Alternative C would have a relatively small but positive impact on the regional economy.

Cumulative Impacts. There would be no significant cumulative impacts on the regional economy as a result of this alternative.

Analysis. Camping, picnicking, hiking, horseback riding, and many other activities previously enjoyed by local visitors would continue to be available in the park. However, hunting, tree cutting, unrestricted four-wheel driving, camping in undesignated sites along roads, trapping, commercial harvesting of pinyon nuts, prospecting, and collecting minerals, plants, and animals would no longer be allowed. Policies prohibiting or closely regulating these and similar uses would adversely affect local visitors who have

TABLE 19: SUMMARY OF IMPACTS ON THE REGIONAL ECONOMY – ALTERNATIVE C

Construction Expenditures (1990 dollars)

	Total Costs (\$MM)	Total Business Activity (\$MM)	Personal Income and Business Taxes (\$MM)	Total Jobs (FTE)
Pre-Park	0	0	0	0
Existing	0	0	0	0
Future Region	34.7	50.8	21.5	533
Nonregion	34.7	34.2	13.9	322

Operating Budget Expenditures (1990 dollars)

	Total Budget (\$000)	Regional Purchases (\$000)	Total Business Activity (\$000)	Personal Income and Business Taxes (\$000)	Total Jobs (FTE)
Pre-Park	256	170	302	230	10
Existing	1,310	874	1,487	1,124	46
Future	2,231	1,515	2,667	2,076	87

Visitor Expenditures (1990 dollars)

	Total Expenditures (\$000)	Total Business Activity (\$000)	Personal Income and Business Taxes (\$000)	Total Jobs (FTE)
Pre-Park	746	1,028	497	25
Existing	1,513	2,099	1,013	51
Future Stable	1,604	2,224	1,074	54
Enhanced	3,208	4,448	2,148	108

traditionally participated in these activities. These effects would be partially mitigated by the fact that other public lands are available in the area where consumptive uses are permitted.

Local visitors might also object to the increasing number of other visitors that the national park attracts. There would be increased competition for campsites, more crowding at popular visitor attractions, more hikers on backcountry trails, and generally reduced opportunities for solitude.

Conclusion. The park would continue to provide opportunities for nonconsumptive recreational activities by local visitors; however, some of these activities would be more closely regulated than in the past. Some consumptive uses would be prohibited or allowed only under permit.

Cumulative impacts. The state of Nevada and the area surrounding the park have a vast amount of public land where consumptive uses and unregulated recreational activities can take place. Therefore, the cumulative impacts on local visitors would be minimal.

Impacts
on Other
Visitors

Analysis. The impacts of this alternative would be similar to those of the proposed action except that the emphasis would be on easy access and relatively structured activities. Alternative C would open most of the park for exploration and discovery and would improve orientation, information, and interpretation. The park would be zoned to establish a range of experiences, but more areas would be opened to vehicle access and more visitor facilities would be included.

Orientation services would be provided along the major highways providing access to the park and at the new Baker orientation center. At the Baker facility visitors could familiarize themselves with the park and region and could plan activities according to their interests. The new eastern extension of Wheeler Peak Scenic Drive would provide a more pleasing approach to the park and would set the scene for Great Basin experiences. The interpretive pullouts along the scenic drive would introduce visitors to most of the region's major life zones and scenic and historic resources.

The new Kiouas Basin visitor center would provide interpretation of the entire Great Basin physiographic region, broadening the currently narrow interpretive emphasis on caves to encompass a wide spectrum of natural and cultural history themes. The outdoor viewing deck at the visitor center would offer panoramic views of the basins to the north, east, and south, dramatically illustrating the primary

park theme. The redesigned Lehman Cave interpretive center would include additional space for in-depth cave interpretation. Support facilities and services in the new visitor center and interpretive center would enhance experiences and make visits to these facilities more pleasant.

Interpretive and recreational opportunities in other areas of the park would also be enhanced. Pullouts and trails along Wheeler Peak Scenic Drive would interpret significant resources and features, and the new pullout/trailhead at the end of the scenic drive would improve access into the Wheeler Peak day use area. Camping opportunities would be increased at Baker Creek, Lehman Flats, and Snake Creek. Sites and features at Strawberry Creek, Big Wash, and Lexington Arch would be opened to two-wheel-drive travel, and more rustic camping and hiking opportunities would be available in these areas. The Mt. Washington vicinity would be opened for four-wheel-drive access. Interpretive panels at all trailheads and campgrounds would provide orientation to specific areas of the park. New barrier-free facilities and modified existing facilities would make more areas of the park accessible to disabled visitors.

Opportunities to explore the park's backcountry would be greatly expanded through the repair and rehabilitation of existing trails and the construction of eight new trail segments, which would link existing trails to provide a parkwide trail system. Most of the backcountry would be accessible on trails, and only small areas would be zoned primitive.

A number of actions in the plan would reduce potential safety hazards or eliminate undesirable conditions in the park. Shoulder widening and road stabilization would improve safety and accessibility at points of interest along the Wheeler Peak Scenic Drive. Relocation and expansion of the Wheeler Peak pullout/trailhead would reduce congestion and pedestrian hazards at the existing trailhead parking area. Paving the Baker Creek spur road and Snake Creek road would permit easy access to these areas and would eliminate the sometimes high amounts of ambient dust in the vicinity. Upgrading roads at Strawberry Creek, Big Wash, and Lexington Arch would allow safe two-wheel-drive access to these areas. Eliminating a portion of the Grey Cliffs campground would reduce potential safety hazards there in the event of the flash flood. Removing equipment and hazardous materials from mines and stabilizing mine shafts would increase safety for backcountry users.

Prohibiting oversized vehicles and RVs from traveling up Wheeler Peak Scenic Drive beyond Lehman Curve would inconvenience visitors in such vehicles who had no alternate means of transportation. However, this prohibition would improve safety for other motorists using the scenic drive.

Conclusion. This alternative would expand visitor understanding of the park and the Great Basin physiographic region by improving access and creating an interpretive experience on Mt. Washington, providing an interpretive experience on the new Wheeler Peak Scenic Drive, opening a new visitor center at Kiouas Basin, and generally improving interpretive services throughout the park and region. It would also make many more areas of the park accessible to the general public.

Cumulative Impacts. There would be no cumulative impacts on visitors as a result of this alternative.

MANAGEMENT

Impacts on
Park
Management
and
Operations

Analysis. Substantial increases (above 1989 staffing and funding levels) in law enforcement and resource management personnel and funding would be required to

handle the 20 to 25 percent increase in visitation that is projected over the next 10 years

monitor use on the new 7-mile extension of Wheeler Peak Scenic Drive (entrance road)

support increasing use in the Snake Creek, Strawberry Creek, Lexington Arch, and Mt. Washington portions of the park and actively manage and protect the proposed visitor use area at the base of Mt. Washington

monitor increasing backcountry use (approximately 79 miles of trails would be designated and maintained as compared to the 20 miles of currently maintained backcountry trails)

implement the management zoning system and monitor activities

complete a biological inventory and implement a *limits of acceptable change* monitoring program

implement and administer the grazing management plan, fire management plan, and cave management plan.

Substantial increases in maintenance personnel and funding would also be required to repair, upgrade, and maintain the

expanded backcountry trail system; the developments associated with the new visitor center, the Lehman Cave ticket sales and interpretive center, and the Wheeler Peak pullout/trailhead; the new park developments in the Mt. Washington area; the new and existing campgrounds, campsites, and trailheads; the regional and park interpretive pullouts; the new visitor orientation, housing, and administrative facilities; the expanded water and sewer treatment system; and the additional 43 miles of access roads outside the park boundary.

Moderate increases in interpretive personnel and funding would be needed to support interpretive programs and services at the new visitor center and the Wheeler Peak day use area.

Additional administrative personnel would be needed to manage the 74 percent increase in park staff and associated increases in purchasing needs.

Analysis. Under this alternative approximately 25 acres of Forest Service land would be transferred to the Park Service for a visitor contact/interpretive center, housing, parking, and a small maintenance complex. This land transfer would have no adverse effects of the Forest Service. The Park Service would maintain the access road and all utilities in the area, and the additional visitors coming to Mt. Washington would not be likely to use adjacent Forest Service lands in large numbers. There would be some benefits for the Forest Service because of the increased ranger and law enforcement presence in the area. Park personnel could assist in responding to forest fires on Forest Service lands, help protect lands from vandalism, arson, or other illegal activities, and provide information for visitors wishing to use Forest Service areas.

This alternative would also involve NPS acquisition of rights-of-ways along several roads that enter the park and upgrading of these roads where they cross Forest Service and BLM land before reaching the park. Table 20 indicates the length of these roads and the approximate amount of land that would be involved in the proposed right-of-ways for the park access roads.

When the Park Service assumed responsibility for maintenance on these roads, the Forest Service and Bureau of Land Management would no longer have to spend time and funds to maintain them and could use maintenance resources elsewhere. Both agencies would use these roads for the management of lands adjacent to NPS rights-of-way.

Impacts on
U.S. Forest
Service
and Bureau
of Land
Management
Operations

TABLE 20: PROPOSED RIGHTS-OF-WAY THROUGH USFS AND BLM LAND -
ALTERNATIVE C

	Approximate Mileage through USFS Land	Approximate Acres of Proposed Right-of-Way	Approximate Mileage through BLM Land	Approximate Acreage of Proposed Right-of-Way
New Park Entrance	-	-	7.3	725
Strawberry Creek Road	0.5	25	2.2	106
Snake Creek Road	1.3	65	4.2	204
Big Wash Road	2.9	144	6.5	315
Lexington Arch Road	3.8	291	7.7	373
Lincoln Canyon/Mt. Washington Road	5.0	240	1.4	70

Lands within the rights-of-way would still be available for traditional uses, including recreation, grazing, developments, and public and private uses, as long as they did not cause visual intrusions on the rights of way.

Conclusion. There would be few impacts on the Forest Service and Bureau of Land Management as a result of this alternative. Land transfers and NPS rights-of-way would increase the overall efficiency of public land administration in the Great Basin region.

Cumulative Impacts. There would be no known cumulative impacts on the Forest Service or the Bureau of Land Management as a result of this alternative.



CONSULTATION AND COORDINATION / PREPARERS

SCOPING PROCESS

Public workshops, meetings, a park newspaper, and a workbook of alternatives were included in the scoping process for Great Basin National Park general management plan. Their purpose was to identify all issues and alternatives that should be considered in planning and to keep the public informed throughout plan formulation.

In June 1987 a press release announced the intention of the National Park Service to prepare a general management plan and accompanying environmental assessment for Great Basin National Park. The announcement described the purposes and strategies to be developed, and it announced five public workshops.

PUBLIC SCOPING WORKSHOPS

The National Park Service held a series of public involvement workshops in late July 1987 to gather information concerning the public's needs, desires, and expectations regarding the future of Great Basin National Park. The five workshops were attended by a total of 93 people. Meetings were held on July 27 in Baker, Nevada, with 47 participants; July 28 in Ely, Nevada, with 16 participants; July 29 in Reno, Nevada, with 15 participants; July 30 in Las Vegas, with 7 participants; and July 31 in Salt Lake City, Utah, with 8 participants. At each workshop the team presented highlights of the legislation and the time table of events associated with the plan preparation (specifically noting the milestones where the public would be involved in the process). The public was invited to discuss their ideas and concerns about the issues. Comments were recorded at each meeting and later printed in a pamphlet entitled *Great Basin Public Involvement Issues*. The pamphlet was then sent to everyone on the Great Basin mailing list. A summary of major public concerns follows.

Fish and Fish Stocking. Many people expressed a concern that fishing and fish stocking should continue in the park. However, a few participants felt that fish stocking was inappropriate if it would compete with the reestablishment of native species.

Ranching and Grazing. Almost all regional and local participants wanted grazing to continue and were concerned that the Park Service might attempt to eliminate grazing through overregulation. Several participants felt that grazing is inappropriate in a national park. Most people agreed that some corrective measures are needed to minimize

visitor/livestock conflicts and to keep livestock out of the developed campgrounds.

Mining. The opinions expressed about mining in the park ranged from those who wanted to see mining continue and those who wanted to see it prohibited.

Water Rights. Individuals with existing water rights were adamant in their desire to maintain them.

Wilderness. Both pro and con support was expressed regarding wilderness designation in the park.

Wildlife Management. Many local and regional participants were concerned that the legislated closure of the park to hunting will cause the deer population to increase, creating problems of overgrazing and competition with livestock within the park and on ranches adjacent to the park.

Although hunting is prohibited by the establishing legislation, some people suggested that hunting should be allowed in the park and used as a management tool to control deer herds. Others felt that hunting is not an appropriate activity within the park.

Most people agreed that threatened and endangered species should be preserved and protected, but there was no consensus on whether grazing activities conflict with this preservation goal.

Impact of the Park on the Community of Baker. A paramount concern expressed by local residents was that tourism will greatly increase the need for support services such as water, waste treatment, waste disposal, and housing in nearby towns. Many residents were concerned about how local towns and communities will be affected by tourism and where they can get assistance to plan and implement actions to meet future demands.

Many Baker residents expressed their interest in using a parcel of appropriate federal property in Baker (lands withdrawn by the U.S. Forest Service) for community purposes.

Several local participants wanted to see improvements in services, including search and rescue, law enforcement, fire protection, and emergency medical services.

Most local participants wanted to be allowed to collect firewood within the park boundary.

Both local and regional participants wanted the Park Service to hire more local employees and award more contracts to local and regional firms.

Many local and regional people wanted the Park Service to undertake an economic study to determine how the new park will impact local and regional communities.

Park Development. Almost everyone agreed that development should be balanced carefully with need; no one wanted to see the park overdeveloped. There was no clear consensus on whether all NPS development should remain in the park or some be relocated outside the park boundary. Some people wanted a new visitor center with expanded concession facilities.

Many participants felt that the park needs more campgrounds and that the existing campgrounds need improvements such as potable water. Some felt that any additional campgrounds should include full services regardless of whether they are inside or outside the park boundary. There were also some who wanted the campgrounds to remain "just as they are now."

The issue of road access was discussed frequently. Some participants wanted improved road access to open more of the park. Some local residents wanted to continue to have four-wheel-drive vehicle access to backcountry roads in the park. Others wanted existing roads closed to restrict use to only specific areas of the park.

Visitor Use and Interpretation. Almost everyone agreed that interpretation should be expanded to include a broader range of theme topics represented by Great Basin National Park.

Many participants expressed a need to improve prearrival information services so visitors can better plan their trips to the park.

Many people said that the Park Service must develop more effective management strategies to solve problems associated with cave tours. (More people arrive on holiday

weekends than can be accommodated on cave tours.) These people also felt that visitors should not be denied the opportunity to experience Lehman Cave. Several participants said that visitors should be encouraged to use other park areas to reduce visitation pressure at the cave and visitor center.

Almost everyone agreed that the trails and trailheads in the park need to be improved and expanded to provide a variety of experiences for the people who visit the park.

Most people favored the idea of offering off-season and winter recreation activities to attract tourists to the park on a year-round basis. Several favored cross-country skiing and the use of snowmobiles as long as they are properly regulated.

There were both pro and con statements regarding all-terrain-vehicle (ATV) use within the park. Several participants wanted to see regulated four-wheel-drive use in the park. Several people also requested that hang gliding be allowed.

Bus concessions to Wheeler Peak, four-wheel-drive tours of Mt. Washington, campground concessions (inside and outside the park), and horseback riding concessions were all mentioned as ways to improve visitor services.

Almost everyone agreed that representative portions of the park should be accessible to disabled visitors.

Park Expansion. The opinions on park expansion ranged from those who wanted no further expansion to those who preferred large-scale expansion to take in the spectrum of representative Great Basin areas, including basin lands at lower elevations. Some participants said that they did not want to see the Forest Service land surrounding the park turned over to the Park Service.

Communications. A paramount concern was the limited public notice given the five public meetings. The participants indicated that the NPS had not adequately "gotten the word out." Most local and regional participants wanted to see more communication between locals and park management. The same concern was expressed that better communication be developed between the park, state, and county government.

Some members of the public wanted to see an advisory commission established. This commission would participate

with the NPS, state, and county in both the management and planning of this new park.

Cultural Resources. Almost everyone expressed a need for the identification, preservation, and interpretation of cultural resources.

**SCOPING
MEETINGS**

In July 1987 the Park Service also sent letters to 13 Nevada state agencies, eight Utah state agencies, four federal agencies, the Ely Colony Tribal Council, and the Duckwater Tribal Council requesting each agency and organization to designate one person to serve as a key contact for this planning effort. Both states, four federal agencies, and the Ely Colony Council provided designated contacts.

Four additional meetings were conducted as part of the scoping process during March 1988. These four sessions included a brief presentation of issues, the planning process, and the schedule. The first meeting was held on March 28 in Salt Lake City. Invited participants included representatives from

Senator E.J. "Jake" Garn's Office
Senator Orrin Hatch's Office
Representative James Hansen's Office
Representative Howard Nielson's Office
Representative Wayne Owens' Office
Utah Governor's Office
Utah Department of Natural Resources
Utah Department of Transportation
Utah Division of Parks and Recreation
Utah Division of Wildlife Resources
Utah Travel Council
U.S. Forest Service (Utah)

The second meeting was held on March 29 in Reno. Participants were invited from

Senator Jacob "Chic" Hecht's Office
Senator Harry Reid's Office
Representative James Bilbray's Office
Representative Barbara Vucanovich's Office

On the same day a meeting was conducted in Carson City. Participants were invited from

Nevada Governor's Office
U.S. Forest Service (Nevada)
Bureau of Land Management (Nevada)

Bureau of Indian Affairs (Eastern Nevada Agency)
Ely Colony Tribal Council
Duckwater Tribal Council
Nevada Commission on Tourism
Nevada Department of Agriculture
Nevada Department of Commerce
Nevada Department of Conservation and Natural Resources
Nevada Department of Education
Nevada Department of Minerals
Nevada Department of Transportation
Nevada Department of Wildlife
Nevada Division of Historic Preservation and Archeology
Nevada Economic Development Commission
Nevada Legislative Council Bureau
Nevada Office of Community Services

On March 30 the fourth meeting was held in Ely. Invited participants included

Ely Colony Tribal Council
Duckwater Tribal Council
Paiute Indian Tribe
White Pine County Board of Commissioners
Baker Town Advisory Board
Bureau of Indian Affairs (Eastern Nevada Agency)

The park newspaper - *The Bristlecone* - has provided periodic updates (summer issue 1988, winter/spring issue 1989) on the status of the general management plan study effort.

**PARK
NEWSPAPER**

In October 1988 an *Alternatives Workbook* was released to the public, requesting people's opinions about the preliminary alternatives for the Great Basin general management plan. Four alternatives plus an existing conditions alternative were presented. Approximately 1,500 copies of the workbook were mailed, and 608 responses were received. Initially all responses were due on November 15, 1988; however, because of the interest expressed, the review period was extended to December 2. All responses were subsequently analyzed by the planning team.

**ALTERNATIVES
WORKBOOK**

In February 1989 a *Summary of Responses to the Alternatives Workbook* was prepared by the planning team and sent to everyone on the Great Basin mailing list. The summary contained two types of response information. The first section summarized responses to questions concerning the recreation opportunity spectrum (ROS) classes (park

SCOPING PROCESS

zoning scheme), visitor uses, developments, and resource management practices in the park. The second section presented responses from the "Additional Issues and Concerns" section of the workbook, where people were encouraged to use blank space to write any additional comments. Approximately 50 percent of the additional comments were randomly selected for presentation in the summary. Following is a summary of the public's reaction to 38 specific questions asked by the planning team.

The reaction to the alternative zoning schemes was mixed, with no single zoning scheme clearly preferred by the respondents. However, the responses indicated that many people were strongly in support of the concept of zoning a portion of the park as "rural."

Most respondents exhibited strong support for a new visitor center, and more indicated a preference for siting it on Baker Ridge than in Kiou Basin. Most proposed developments on the east side of the park, including a campground at Lehman Flats, parking lots at Lehman Cave and Wheeler Peak, a new entrance road, and minor upgrades of gravel roads were also supported. However, proposals to improve access on the south and west sides of the park were not supported; most respondents indicated that these areas should remain relatively inaccessible.

Regarding removing existing facilities, most respondents felt that the Lehman Cave visitor center should not be removed or replaced and the campground at Wheeler Peak should not be converted to a picnic area. However, a majority responded that park housing, administration, and maintenance facilities should be removed from the park and relocated outside the park boundary.

Respondents indicated strong support for protecting and restoring all naturally occurring species, including native predators. Species included bighorn sheep, peregrine falcons, bald eagles, elk, sensitive plant species, and Bonneville cutthroat trout.

A majority of people felt that the park boundaries should be expanded by 1,200 acres east of the proposed Baker Ridge visitor center and by 1,600 acres in the vicinity of Mt. Washington.

Of the public comments that were not responses to specific workbook questions, the issue receiving the most comments

was domestic livestock grazing in the park. The vast majority of commenters supported eliminating grazing from the park either immediately or over time.

On April 4, 1989, the planning team presented the Great Basin general management plan alternatives to Senator Reid and Representative Vucanovich and the aides of Senator Bryan and Representative Bilbray in Washington, D.C.

ALTERNATIVES
CONSULTATION
WITH THE
CONGRESSIONAL
DELEGATION

On April 12, 1989, the planning team presented the alternatives to representatives of the following agencies and groups in a meeting held in Carson City, Nevada:

ALTERNATIVES
CONSULTATION
WITH STATE
AGENCIES,
COUNTY
AGENCIES, AND
LOCAL
INTERESTS

Nevada Governor's Office
Nevada Department of Agriculture
Nevada Department of Commerce
Nevada Department of Conservation and Natural Resources
Nevada Department of Wildlife
Nevada Division of Environmental Protection
Nevada Division of Historic Preservation/Archeology
Nevada Division of State Parks
Nevada Division of State Lands
Nevada Economic Development Commission
Baker Town Advisory Board
Ely Colony Tribal Council
White Pine County Board of Commissioners

On July 18, 1989, the planning team presented the alternatives to representatives of the following federal agencies in meetings held in Reno and Ogden:

ALTERNATIVES
CONSULTATION
WITH FEDERAL
AGENCIES
DIRECTLY
AFFECTED
BY THE
PLANNING
EFFORT

State Director, Nevada State Field Office,
Bureau of Land Management
Regional Forester, Intermountain Region,
U.S. Forest Service
State Director, Utah State Field Office,
Bureau of Land Management

During April 1989 members of the planning team met at the park with a representative of the National Parks and Conservation Association to present and discuss the alternatives on site.

ALTERNATIVES
CONSULTATION
WITH NATIONAL
PARKS AND
CONSERVATION
ASSOCIATION

**ALTERNATIVES
CONSULTATION
WITH WHITE
PINE COUNTY
BOARD OF
COMMISSIONERS**

During April 1989 the superintendent met at the park with a representative of the board of commissioners to present and discuss the alternatives on site.

**ENVIRONMENTAL
IMPACT
STATEMENT
NOTICE OF
INTENT FILED
IN FEDERAL
REGISTER**

During the spring of 1989 the regional director of the National Park Service's Western Region Office decided that an environmental assessment would not adequately support the Great Basin general management plan effort. In response to this decision, on May 19, 1989, a notice of intent (NOI) was placed in the *Federal Register* to prepare an environmental impact statement for this project.

**ALTERNATIVES
CONSULTATION
WITH THE
BAKER
ADVISORY
BOARD
AND THE PARK
CONCESSIONER**

During the fall of 1989 the superintendent met at the park with a representative of the Baker Advisory Board and the park concessioner to present and discuss the alternatives.

**ALTERNATIVES
CONSULTATION
WITH SENATOR
BRYAN**

During the fall of 1989 the superintendent met with Senator Bryan at the park to present and discuss the alternatives on site.

In April 1987 the Ely Colony Tribal Council and the Duckwater Tribal Council were included on the Great Basin mailing list. In June 1987 a press release was sent to the entire mailing list, inviting all addressees to attend one or more of the five public workshops held in July 1987. No one who attended these five workshops identified themselves as representatives of the Ely or Duckwater Tribal Councils.

**CONSULTATION
WITH NATIVE
AMERICANS**

In July 1987 the Park Service sent letters to the Ely and Duckwater Tribal Councils, requesting that each tribe designate a key contact for this planning effort. On September 10, 1987, the Park Service received a letter from the Ely Colony Tribal Council designating Mr. Peter Ford as its key contact. The Duckwater Tribal Council never responded.

The Park Service sent letters to and made telephone contact with the Ely Colony Tribal Council, the Duckwater Tribal Council, and the Paiute Indian Tribe (Cedar City) inviting them to attend a scoping workshop session in Ely, Nevada, on March 30, 1988. The Ely Colony Council was the only tribal group that sent a representative to the meeting.

The *Alternatives Workbook* was sent to everyone on the mailing list. Because people did not have to identify themselves, it is not known if any of the tribal groups responded.

The Ely Colony Tribal Council was represented at a presentation of the Great Basin alternatives held in Carson City, Nevada, on April 12, 1989.

LIST OF AGENCIES AND ORGANIZATIONS TO WHOM COPIES OF THE ENVIRONMENTAL IMPACT STATEMENT ARE BEING SENT

FEDERAL AGENCIES

Advisory Council on Historic Preservation
 Department of Agriculture
 Forest Service
 Elko Ranger District
 Ely Ranger District
 Humboldt National Forest
 Intermountain Region
 Soil Conservation Service
 Department of Defense
 Department of the Air Force
 Department of the Army
 Department of the Interior
 Bureau of Indian Affairs
 Eastern Nevada Agency
 Western Nevada Agency
 Bureau of Land Management
 Burley District
 Ely District
 Utah Field Office
 Nevada Field Office
 Bureau of Mines
 Geological Survey
 Fish and Wildlife Service
 Regional Office, Portland, Oregon
 Reno Field Office
 Department of Transportation
 Federal Highway Administration
 Region 8
 Region 9
 Environmental Protection Agency
 Region 9
 U.S. Post Office, Baker
 U.S. Post Office, Garrison

NEVADA CONGRESSIONAL DELEGATION

Senator Richard Bryan
 Senator Harry Reid
 Representative James Bilbray
 Representative Barbara Vucanovich

UTAH CONGRESSIONAL DELEGATION

Senator E. J. "Jake" Garn
 Senator Orrin Hatch
 Representative James Hansen
 Representative Bill Orton
 Representative Wayne Owens

Governor Bob Miller
 Senator Virgil Getto
 Senator John M. Vergies
 Assemblyman Joseph E. Dini
 Assemblyman Mike McGinness
 Commission on Tourism
 Department of Administration
 Department of Agriculture
 Department of Commerce
 Department of Conservation/Natural Resources
 Department of Minerals
 Department of Transportation
 Department of Wildlife
 Division of Environmental Protection
 Division of State Lands
 Division of State Parks
 Division of Water Planning
 Economic Development Commission
 Legislative Council Bureau, Research Division
 Office of Community Services
 State Historic Preservation Officer

STATE OF NEVADA

Governor Norman Bangerter
 Senator Arnold Christensen
 Representative H. Craig Moody
 Department of Natural Resources
 Department of Transportation
 Division of Wildlife Resources
 Utah Travel Council

STATE OF UTAH

Beaver County Board of County Commissioners
 Lincoln County Board of County Commissioners
 Millard County Board of County Commissioners
 White Pine County Board of County Commissioners
 Baker Town Advisory Board

COUNTY AND LOCAL GOVERNMENTS

Carson City
 Cedar City
 Great Basin (Baker)
 Reno-Sparks
 St. George
 White Pine

CHAMBERS OF COMMERCE

NATIVE AMERICAN GROUPS	Battle Mountain Tribal Council	Trust for Public Land	
	Duckwater/Shoshone Indian Council	Wheeler Service Station, Garrison	
	Ely Shoshone Tribe		
	Paiute Indian Tribe		
	Pyramid Lake Tribal Council	Beaver County Library	LOCAL
	Reno/Sparks Tribal Council	Harold E. Lee Library, Brigham Young University	LIBRARIES
	South Fork Band Council	Lincoln County Library	
	Wells Band Council	Millard County Library	
		Southern Utah University Library	
		White Pine County Library	
GRAZING PERMITTEES	Dean Baker		
	John Bidart		
	David Eldridge	Beaver County News, Milford	MAGAZINES
	Owen L. Gonder	Color Country Spectrum, Cedar City and St. George	AND
		Deseret News-Telegram, Salt Lake City	NEWSPAPERS
		Ely Daily Times	
MINERAL INTERESTS	Thomas Bath (White Marble Claim Group)	Humboldt Sun, Winnemucca	
	Blue Energy Resources, Inc. (Mercury Rover Claim Group)	Las Vegas Review Journal	
	Robert L. Christiansen (Clara Belle Claim Group)	Millard County Chronicle, Delta	
	National Treasure Mines, Inc. (Pole Claim Group)	Motorland Magazine, San Francisco	
	Reed B. Robison (Robison Claim Group)	Ogden Standard Examiner	
	Washington Minerals Corporation (Fenkite Claim Group)	Provo Herald	
		Reno Gazette-Journal	
		Salina Sun	
		Salt Lake Tribune	
		San Francisco Chronicle	
		Tahoe Daily Tribune, South Lake Tahoe	
		The Daily Spectrum, St. George	
ORGANIZATIONS AND BUSINESSES	Baker Service Station	KDXU St. George	RADIO
	Baker Senior Citizens Center	KELY East Ely	STATIONS
	Border Inn, Baker	KHITS Reno	
	Citizen Alert	KISN/KLUB Salt Lake City	
	Dames and Moore Associates	KLRZ Provo	
	Defenders of Wildlife	KNAK Delta	
	Eskdale Community, Garrison	KOA Ely	
	Friends of Nevada Wilderness	KRCL Salt Lake City	
	Hitchin' Post, Baker	KREC Cedar City	
	Las Vegas News Bureau	KROI Sparks	
	National Parks and Conservation Association	KSOP West Valley	
	National Geographic Society	KSUB Cedar City	
	Nevada Cattlemen's Association	KWNA Winnemucca	
	Nevada Mining Association		
	Nevada Camera Club, Las Vegas		
	New White Pine Sportsmen's Club		
	Outlaw, Baker		
	Panoramaland, Richfield		
	School of Natural Order, Baker		
	Sierra Club		
	San Francisco Office		
	Southern Nevada Group, Las Vegas		
	Toiyabe Chapter, Reno		
	Silver Jack Motel, Baker		
	The Nature Conservancy		
	Arlington, Virginia, Office		
	Great Basin Field Office		
	The Wilderness Society		
	The "Y", Baker		

PREPARERS, CONTRIBUTORS, AND CONSULTANTS

PREPARERS

Bart Young
Outdoor Recreation Planner and Team Captain, Denver Service Center, BS Forestry, MS Forestry and Environmental Studies

Coordinated and supervised EIS production, including schedule, budget, team production, GIS analysis and input, outside consultant contributions, and related studies; made all project presentations; developed the management zoning concept and produced the "Management Zoning Concept" section as well as all information in the proposed action and alternatives related to management zoning; produced all narrative information related to the Great Basin viewshed analysis; produced portions of the first-draft visitor use proposals, and revised the first-draft visitor use, interpretation, and development proposals to produce the "Visitor Use and Development" sections of the proposed action and alternatives; produced portions of the "Socioeconomic Environment" and "Management" subsections of the "Environmental Consequences" section; produced the "Compliance Status" section (appendix G).

Al Hendricks
Superintendent, Great Basin National Park,
BA Geography/Geology

Assisted in the production and review of the proposed action and alternatives; coordinated park staff input; coordinated consultations with selected agencies, organizations, and individuals as well as all public involvement meetings and workshops; produced the "Staffing" section (appendix H).

Jim Hammett
Senior Natural Resource Specialist, Denver Service Center,
BS Forestry, MS Vegetation Ecology

Coordinated the analysis of natural resources and the effects of possible future actions on them; produced the "Exceptional Resources" section, the "Natural Resource Management" sections of the proposed action and alternatives, and all "Affected Environment" and "Environmental Consequences" sections related to natural resources; maintained quality control over GIS production; developed the statistical analysis for the workbook responses.

Kay Roush
Writer-Editor, Denver Service Center, BA History

Produced the "Summary," "Impacts on Local Visitors," and "Impacts on Other Visitors" sections; edited the entire document and coordinated its production.

Pat Sacks
Landscape Architect, Denver Service Center,
BS Natural Resources, MLA Landscape Architecture

Developed and produced most of the design proposals for the development concept plans in the document; produced the first draft of the development sections for the proposed action and alternatives as well as portions of the "Affected Environment" section; produced all development-related graphics included in the review draft EIS and all graphics used in presentations.

Mark Tabor
Landscape Architect, Denver Service Center,
BS Conservation of Natural Resources,
MLA Landscape Architecture

Developed the Wheeler Peak pullout/trailhead development concept plan.

Harlan Unrau
Cultural Resource Specialist, Denver Service Center,
BA, MA History

Coordinated the analysis of cultural resources and the effects of possible future actions on them; produced the "Cultural Resource Management" sections of the proposed action and alternatives, and all "Affected Environment" and "Environmental Consequences" sections related to cultural resources; produced the 1990 *Historic Resource Study* for the park.

Larry Tillman
Interpretive Planner (retired, formerly with Harpers Ferry Center)

Developed the interpretive proposals for the proposed action and alternatives sections of the document.

Cynthia Young
Community Planner, Denver Service Center,
BA, MA Urban and Regional Planning

Coordinated the economic study contract and produced the
"Impacts on the Regional Economy" sections of the
document.

Robert Allen
Landscape Architect, Denver Service Center,
MA Environmental Planning and Design/Landscape
Architecture

Assisted in data collection for the resource base information
analysis.

CONTRIBUTORS

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Denver Service Center	Allen Hagood, Planner/Geologist Gary Waggoner, Senior Geographical Information Specialist, Denver/Washington Office Mike Reynolds, Geographical Information Specialist Janet Runas, Geographical Information Specialist Terry Goodrich, Park Road Planning Coordinator Al Galipeau, Statistician, Denver/Washington Office Ray Borras, Former Estimator Greg Jarvis, Planning Technician Sally Snyder, Planning Technician Anne Shewell, Visual Information Specialist Joan Huff, Visual Information Technician
Washington Office	Alice Johns, Hydrologist, Water Rights Branch, Water Resources Division

Erik Hauge, Environmental Specialist, Air Quality Division
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Gary Johnson, Section Chief, Western Team,
Denver Service Center

Betty Janes, Chief of Planning, Western Team,
Denver Service Center

Frank Williss, Cultural Compliance Specialist,
Western Team, Denver Service Center

Jim Huddleston, Environmental Specialist,
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Preservation, Western Regional Office

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Administration

Teri Knight, Research Scientist/Botanist,
Nevada Natural Heritage Program

Richard Navarre, Field Supervisor,
U.S. Fish and Wildlife Service, Reno Field Station

Richard Haskins, Fisheries Biologist,
Nevada Department of Wildlife, Ely Office

Rita Suminsik, Wildlife Biologist, Humboldt National Forest,
Ely Ranger District

Jerry Smith, Egan Resource Manager,
Bureau of Land Management, Ely District

Richard Johnson, Research Botanist,
Washington State University

Nevada Historic Preservation Office

Advisory Council on Historic Preservation

Clynn Phillips and David Taylor, Western Analysis Company,
Laramie, Wyoming, (economic study)

CONSULTANTS

National
Park Service

Other



APPENDIXES / BIBLIOGRAPHY

APPENDIX A: PUBLIC LAW 99-565

PUBLIC LAW 99-565—OCT. 27, 1986	100 STAT. 3181	100 STAT. 3182	PUBLIC LAW 99-565—OCT. 27, 1986
Public Law 99-565 99th Congress			ADMINISTRATION
An Act			
To establish a Great Basin National Park in the State of Nevada, and for other purposes	Oct. 27, 1986 [S. 2506]	Conservation Fish and Fishing Wildlife 16 USC 410mm-1.	Sec. 3. (a) The Secretary shall administer the park in accordance with this Act and with the provisions of law generally applicable to units of the national park system, including the Act entitled "An Act to establish a National Park Service, and for other purposes," approved August 26, 1916 (39 Stat. 535; 16 U.S.C. 1-4). The Secretary shall protect, manage, and administer the park in such manner as to conserve and protect the scenery, the natural, geologic, historic, and archaeological resources of the park, including fish and wildlife and to provide for the public use and enjoyment of the same in such a manner as to perpetuate these qualities for future generations.
Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,	Great Basin National Park Act of 1986		(b) The Secretary shall permit fishing on lands and waters under his jurisdiction within the park in accordance with the applicable laws of the United States and the State of Nevada, except that he may designate zones where, and periods when, no fishing may be permitted for reasons of public safety. Except in emergencies, any regulations prescribing such restrictions relating to fishing, shall be put into effect only after consultation with the appropriate State agency having jurisdiction over fishing activities.
SHORT TITLE	16 USC 410mm note.		(c) After notice and opportunity for public hearing, the Secretary shall prepare a management plan for the park. The Secretary shall submit such plan to the Committee on Interior and Insular Affairs of the United States House of Representatives and with the Committee on Energy and Natural Resources of the United States Senate within three years after the enactment of this Act. Such plan may be amended from time to time. The plan shall include, but not be limited to, provisions related to grazing within the park to the extent permitted under subsection (e) and provisions providing for the appropriate management of fish and wildlife and fishing within the park in accordance with subsection (b). Such provisions shall be adopted only after consultation with the appropriate State agency having jurisdiction over fish and wildlife.
SECTION 1. This Act may be known as the "Great Basin National Park Act of 1986."	16 USC 410mm.		(d) Subject to valid existing rights, Federal lands and interests therein, within the park, are withdrawn from disposition under the public lands laws and from entry or appropriation under the mining laws of the United States, from the operation of the mineral leasing laws of the United States, and from operation of the Geothermal Steam Act of 1970, as amended.
ESTABLISHMENT	Public information.		(e) Subject to such limitations, conditions, or regulations as he may prescribe, the Secretary shall permit grazing on lands within the park to the same extent as was permitted on such lands as of July 1, 1985. Grazing within the park shall be administered by the National Park Service.
Sec. 2. (a) In order to preserve for the benefit and inspiration of the people a representative segment of the Great Basin of the Western United States possessing outstanding resources and significant geological and scenic values, there is hereby established the Great Basin National Park (hereinafter in this Act referred to as the "park").	Public information.	30 USC 1901 note.	(f) At the request of the permittee, or at the initiative of the Secretary, negotiations may take place at any time with holders of valid existing grazing permits on land within the park, for an exchange of all or part of their grazing allotments for allotments outside the park. No such exchange shall take place if, in the opinion of the affected Federal land management agency, the exchange would result in overgrazing of Federal lands.
(b) The park shall consist of approximately seventy-six thousand acres, as depicted on the map entitled "Boundary Map, Great Basin National Park, Nevada," numbered NA-GB 20,017, and dated October 1986. The map shall be on file and available for public inspection in the offices of the National Park Service, Department of the Interior, and the Office of the Superintendent, Great Basin National Park, Nevada.			(g) Existing water-related range improvements inside the park may be maintained by the Secretary or the persons benefitting from them, subject to reasonable regulation by the Secretary.
(c) Within 6 months after the enactment of this Act, the Secretary of the Interior (hereinafter in this Act referred to as the "Secretary") shall file a legal description of the park designated under this section with the Committee on Interior and Insular Affairs of the United States House of Representatives and with the Committee on Energy and Natural Resources of the United States Senate. Such legal description shall have the same force and effect as if included in this Act, except that the Secretary may correct clerical and typographical errors in such legal description and in the map referred to in subsection (a). The legal description shall be on file and available for public inspection in the offices of the National Park Service, Department of the Interior.			(h) Nothing in this Act shall be construed to establish a new express or implied reservation to the United States of any water or water-related right with respect to the land described in section 2 of
(d)(1) The Lehman Caves National Monument, designated on January 24, 1922, by Presidential proclamation under the authority contained in the Act of June 8, 1906 (34 Stat. 225) is hereby abolished and the lands incorporated within the Great Basin National Park. Any reference in any law, map, regulation, document, record, or other paper of the United States to such national monument shall be deemed to be a reference to Great Basin National Park.			
(2) Any funds available for purposes of the national monument shall be available for purposes of the park.			

PUBLIC LAW 99-565—OCT. 27, 1986

100 STAT. 3183

this Act. *Provided*, That the United States shall be entitled to only that expense or unpaid reserved water right which may have been assessed with the initial establishment and withdrawal of Humboldt National Forest and the Lehman Caves National Monument from the public domain with respect to the land described in section 2 of this Act. No provision of this Act shall be construed as authorizing the appropriation of water, except in accordance with the substantive and procedural law of the State of Nevada.

(i) In order to encourage unified and cost-effective interpretation of the Great Basin physiographic region, the Secretary is authorized and encouraged to enter into cooperative agreements with other Federal, State, and local public departments and agencies providing for the interpretation of the Great Basin physiographic region. Such agreements shall include, but not be limited to, authority for the Secretary to develop and operate interpretive facilities and programs on lands and waters outside of the boundaries of such park, with the concurrence of the owner or administrator thereof.

State and local
agreements

ACQUISITION OF LAND

SEC. 4. (a) The Secretary may acquire land or interests in land within the boundaries of the park by donation, purchase with donated or appropriated funds, or exchange, but no such lands or interests therein may be acquired without the consent of the owner thereof. Lands owned by the State of Nevada or any political subdivision thereof may be acquired only by donation or exchange.

16 USC
412mm-2

(b) Lands and waters, and interests therein, within the boundaries of the park which were administered by the Forest Service, United States Department of Agriculture prior to the date of enactment of this Act are hereby transferred to the administrative jurisdiction of the Secretary to be administered in accordance with this Act. The boundaries of the Humboldt National Forest shall be adjusted accordingly.

AUTHORIZATION OF APPROPRIATIONS

SEC. 5. (a) Not more than \$800,000 are authorized to be appropriated for development of the park.

16 USC
412mm-4

(b) Not more than \$200,000 are authorized to be appropriated for acquisition of lands and interests in land within the park.

Approved October 27, 1986.

LEGISLATIVE HISTORY—H. R. 2000

SENATE REPORTS No. 99-482 (Comm. on Energy and Natural Resources)

COMMITTEES PRINTED: Vol. 12, 1986

Sept. 30, considered and passed Senate.

Oct. 6, considered and passed House amended.

Oct. 8, Senate returned as House amendments.

○

APPENDIX B: WILDERNESS SUITABILITY

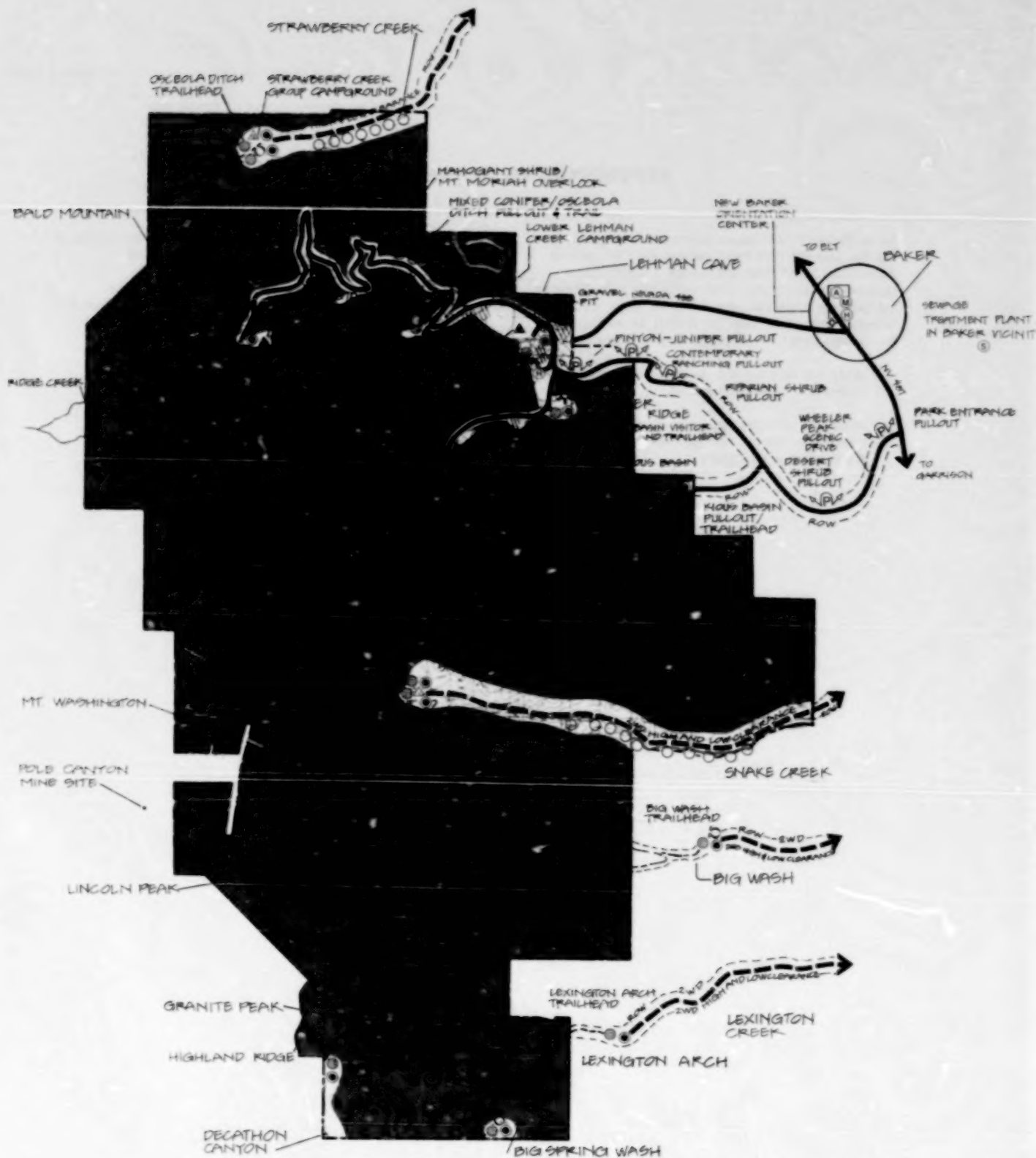
As discussed in the "Issues Beyond the Scope of the General Management Plan" section, the draft general management plan does not provide a wilderness recommendation for the lands within the park. The map on the following page indicates the lands within the park boundary that would meet the criteria for wilderness designation under the proposed action. These criteria are

lands that lack roads or lands where roads would be closed and no longer be used

lands that generally appear to have been affected primarily by nature, with the imprint of man's work substantially unnoticeable

lands that have outstanding opportunities for solitude or a primitive and unconfined type of recreation

contiguous areas of land possessing the above characteristics that are at least 5,000 acres in size or are of a sufficient size as to make practicable their preservation and use in an unimpaired condition



WILDERNESS SUITABILITY GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

148 • 20059 • DSC • SEPT 91

- ☒ SUITABLE FOR WILDERNESS
☐ NOT SUITABLE FOR WILDERNESS



0 1 2 MILES
0 1 2 3 KILOMETERS

APPENDIX C: MANAGEMENT ZONING APPLICATION

The following examples indicate the types of decisions that park managers would have to make to maintain the integrity of management zones and subzones. Decisions on appropriate types of use and levels of physical development would probably be easier to make than decisions that define the limits of use for each subzone. The zoning concept serves as the guideline. Park managers would be responsible for specific decisions to implement and perpetuate the concept.

The determination of acceptable levels of use would be an issue in all of the subzones, particularly as visitation increased. For example, if visitation in the primitive subzone increased to the point where there was pressure to designate trails or provide backcountry campsites with toilets, tables, and tent pads, managers would have to limit use, disperse use, or implement another nondevelopment option.

The rural subzone is intended to provide a special niche between the developed area experience (modern subzone) and the backcountry experience (primitive and semi-primitive subzones). Rustic campsites, spaced to provide a higher degree of privacy and solitude than in

the modern subzone, and access by dirt or gravel roads are critical elements of the rural subzone experience. If visitation increased in this subzone, managers would have to seek alternatives to paving roads or increasing the number or density of campsites, as such actions would destroy the intent in establishing rural areas.

Any type of major facility development or vehicular access (exceptions for emergencies and for restricted access for grazing permittees on a special permit basis) within the primitive or semi-primitive subzone would violate the zoning concept.

If the park manager decided that opportunities for solitude were being sacrificed in the primitive subzone because of increases in backcountry visitation, the zoning concept would provide a basis for actions to establish a permit system or devise other methods to alleviate the condition.

Grazing in the semi-primitive day use and protected and research natural area subzones would violate the zoning concept.

APPENDIX D: CONSULTATION WITH THE U.S. FISH AND WILDLIFE SERVICE



United States Department of the Interior

FISH AND WILDLIFE SERVICE

GREAT BASIN COMPLEX
4600 Kietzke Lane, Bldg. C
Reno, Nevada 89502

August 5, 1987

File No. 1-5-B7-SP-97

Mr. Robert Allen, Jr.
2966 Yates Street
Denver, Colorado 80212

Dear Mr. Allen:

As requested during your July 29, 1987, visit to this office, you will find attached a list of listed endangered and threatened species (Attachment A) that are present or may be present in the Great Basin National Park. To the best of our knowledge, no proposed species occur within the area. The list is intended to fulfill the requirement of the Fish and Wildlife Service to provide a list of species under Section 7(c) of the Endangered Species Act of 1973, as amended. Please see Attachment B for your requirements.

Also, for your assistance we have included a list of species that are candidate species. These species are presently being reviewed by the Fish and Wildlife Service for consideration to propose and list as endangered or threatened. It should be noted that candidate species have no protection under the Endangered Species Act and are included for your consideration as it is possible the candidates could become formal proposals and be listed in the future.

Upon completion of the Biological Assessment (see Attachment B), should you determine that a listed species is likely to be affected, then your agency should request formal Section 7 consultation through this office. If there are both listed and candidate species that may be affected, then if requested, we will informally consult on the candidate species during the formal consultation. However, should the Assessment reveal that only candidate species may be affected, then you should consider informal consultation.

One of the benefits of informal consultation to the consulting agency is to provide the necessary planning alternatives should a candidate species become listed in the future. I am also including management plans for Lahontan cutthroat trout and Bonneville cutthroat trout.

Should you have any additional questions regarding your responsibilities under the Act, please contact this office. We thank you for your interest in endangered species.

Sincerely,

A handwritten signature in dark ink, appearing to read "Richard J. Navarre".

Richard J. Navarre
Complex Manager

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Enclosures

ATTACHMENT A

Listed Species

Bald eagle (Haliaeetus leucocephalus)

Peregrine falcon (Falco peregrinus)

Proposed Species

None

Candidate Species

Category

Animals

Ferruginous hawk (Buteo regalis) 2

Bonneville cutthroat trout (Salmo clarki utah) 2

Plants

Cymopterus nivalis 2

Eriogonum holmgrenii 2

Penstemon concinnus 2

Primula nevadensis 2



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
DENVER SERVICE CENTER
12795 W. ALAMEDA PARKWAY
P.O. BOX 25287
DENVER, COLORADO 80225-0287



JUL 27 1989

D50-19 (DSC-TWE)
GRBA-152-02

Richard J. Navarre
U.S. Fish and Wildlife Service
Great Basin Complex
4600 Kietzke Lane, Building C
Reno, Nevada 89502

Dear Mr. Navarre:

The National Park Service is entering the final stage of writing the General Management Plan and Draft Environmental Impact Statement for Great Basin National Park. Approximately 2 years ago, our office requested a list of species from your agency that are known or suspected of being within the park that are listed or are candidate species for listing under the Federal or State Endangered Species Act or the Nevada Natural Heritage Program. We are required by our management policies to update that list and consult with federal and state organizations yearly through extended planning processes.

Please review the attached list for which you have legal authority to ensure the accuracy of the species listed and their placement within each category. Please provide a detailed explanation for any species additions or deletions and for any category status changes. Your response letter should indicate approval (as per any necessary changes), as it will be filed as an official compliance letter for the Great Basin General Management Plan process.

If you have any questions about this list, please contact me at 303-969-2268 (FTS 327-2268).

Sincerely,

Jim Hammett
Natural Resource Specialist

cc: compliance file
identical letters to:
U.S. Fish and Wildlife Service
Nevada Natural Heritage Program
Nevada Department of Wildlife

Table I

Endangered, Threatened, and Sensitive Species
Known or Suspected of Utilizing Habitat
in Great Basin National Park

	Federal Status	State Status
<u>Birds</u>		
Bald eagle **	E	E
Peregrine falcon *	E	E
Ferruginous hawk *	C	P
Swainson's hawk	C	P
<u>Mammals</u>		
Spotted bat *	C	P
<u>Fish</u>		
Bonneville cutthroat trout	C	S
<u>Insects</u>		
Koret's checkerspot ***	-	-
<u>Plants</u>		
Snow wavewing	C	-
Intermountain wavewing *	C	-
Holmgren's buckwheat	C	-
Tunnel springs beardtongue	C	-
Nevada primrose	C	-
Nachlinger's catchfly ***	-	-
Pennell's Penstemon	-	-

Codes:

E = Endangered
C = Candidate Species
P = Protected (under Nevada law)
S = Sensitive

* not known to be present but habitat is suitable

** transient through the park

*** species recommended for state listing by Nevada Natural Heritage Program

(A more detailed description of these species is found on page * in the *Affected Environment* section).



United States Department of the Interior

FISH AND WILDLIFE SERVICE
RENO FIELD STATION
4600 Kietzke Lane, Building C
Reno, Nevada 89502

August 3, 1989
File No.: 1-5-89-SP-161

MEMORANDUM

To: Chief, Branch of Planning, DSC-TWE, National Park Service, Denver, Colorado

From: Field Supervisor, Reno, Nevada

Subject: Species List Request for the Great Basin National Park

In a letter dated July 27, 1989, Jim Hammett, Natural Resource Specialist, requested a review and update of a list of endangered, threatened, proposed and candidate species which are known or suspected of being within the boundaries of the Great Basin National Park. The list had been compiled two years ago from information received from the U. S. Fish and Wildlife Service and other agencies and organizations. This list will be included in the General Management Plan and Draft Environmental Impact Statement for the Great Basin National Park.

We found the list to be complete, although difficult to review due to the lack of scientific names. We urge you to include the scientific names of all species. Common name usage for certain species varies widely.

Please find attached a list which is based on the one provided by Mr. Hammett, but includes scientific names, and federal status. The category of each candidate species and explanation of those categories is also included, along with reference to the document containing the categorization.

If you have any questions, please contact Donna Withers at (702) 784-5227 or FTS 470-5227.

Attachments

cc: Assistant Regional Director (AFWL), Portland, Oregon

Endangered, Threatened and Sensitive Species
Known or Suspected of Utilizing Habitat
in Great Basin National Park

<u>Birds</u>	<u>Federal Status</u>
Bald eagle, <u>Haliaeetus leucocephalus</u>	E
Peregrine falcon, <u>Falco peregrinus</u>	E
Ferruginous hawk, <u>Buteo regalis</u>	C-2
Swainson's hawk, <u>Buteo swainsoni</u>	C-3C
<u>Mammals</u>	
Spotted bat, <u>Euderma maculatum</u>	C-2
<u>Fish</u>	
Bonneville cutthroat trout, <u>Oncorhynchus clarki utah</u>	C-2
<u>Insects</u>	
Koret's checkerspot, <u>Euphydryas editha koreti</u>	---
<u>Plants</u>	
Snow wavewing, <u>Cymopterus nivalis</u>	C-2
Intermountain wavewing, <u>Cymopterus basalticus</u>	C-3C
Holmgren's buckwheat, <u>Eriogonum holmgrenii</u>	C-2
Tunnel springs beardtongue, <u>Penstemon concinnus</u>	C-2
Nevada primrose, <u>Primula nevadensis</u>	C-2
Nachlinger's catchfly, <u>Silene nachlingerae</u>	---
Pennell's penstemon, <u>Penstemon francisci-pennellii</u>	C-3C

Federal Status:

- E: Endangered
- C-2: Taxa for which information now in the possession of the U. S. Fish and Wildlife Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules.
- C-3C: Taxa that were once being considered for listing as endangered or threatened, but are not currently receiving such consideration. These taxa are now considered to be more widespread than previously thought.

References for candidate species:

U. S. Fish and Wildlife Service.

1989. Endangered and Threatened Wildlife and Plants; Animal Notice of Review. Federal Register, Part IV, Department of Interior, Fish and Wildlife Service, 50 CFR Part 17: January 6, 1989.

U. S. Fish and Wildlife Service.

1985. Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review. Federal Register, Part IV, Department of Interior, Fish and Wildlife Service, 50 CFR Part 17: September 27, 1985.

APPENDIX E: GIS APPLICATION AND BENEFITS TO PROJECT

The general management plan for Great Basin National Park represents one of the first GMPs where NPS planners used a geographic information system (GIS) as the primary method of collecting, storing, and analyzing mappable resource data. Working with the Geographic Information System Division, a Denver-based division of the Natural Resources Office of the National Park Service, planners identified types of information (themes) important to park planning. These themes included features such as roads, topography, hydrography, geology, and vegetation. Once data were obtained, the themes were digitized (placed in a computerized form) and stored on computer tape.

Normally, using typical planning methods, these themes would be mapped by hand and stored on transparent media and later used to manually build up the layers of information needed to analyze problems and generate planning alternatives. The GIS allowed quick retrieval of these themes, but also allowed the layers to be produced at any desired scale. In addition, certain analysis (e.g., acreage and length computation, viewsheds) could be completed much faster and with greater accuracy than with manual methods.

The ability to easily change the scale on finished products allowed tremendous flexibility in analyzing information at various scales - on a very small scale when siting a building, road, or campground, on a larger scale when developing parkwide zoning schemes, or on an even larger scale when analyzing issues that extend beyond park boundaries (viewsheds from the park toward parts of

surrounding basins or from various park approach routes toward the park). This proved to be an extremely powerful tool for a variety of planning tasks.

During the impact analysis for the proposal and alternatives, the GIS was used extensively to quantify the direct impacts of developments on different vegetation types and to analyze the significance of those impacts by appraising the uniqueness of individual vegetation types compared with other vegetation in the park. This technique proved particularly useful in analyzing the impacts of proposed linear developments such as roads and trails that pass through numerous vegetation types, where analysis is often very difficult and tedious.

In what at first was only an experiment, the GIS was used to electronically plan a route for the proposed new park entrance road without any on-site reconnaissance. Planners supplied criteria (i.e., slopes should be 7 degrees or less, stream crossings should be minimized and where necessary should be at right angles to the stream, and the route should be hidden from view from the proposed new visitor center to the fullest extent possible). The resulting plot, which the computer provided with no information other than start and end points, proved to be very accurate and impossible to improve upon when the plot was analyzed on the ground by a road engineer, a landscape architect, and a natural resource specialist.

APPENDIX F: ROAD SYSTEM EVALUATION

The following road system evaluation for Great Basin National Park was prepared in conjunction with the draft general management plan (proposed action) to provide road-related guidance to the planning team and define road proposals that would facilitate preliminary design. Funding for road projects within the national park system is through the federal lands highway program (FLHP), which was created by the Surface Transportation Act of 1982. That act requires advance planning to promote the efficient expenditure of funds. A road system evaluation constitutes Park Service compliance with the requirements of the 1962 act.

Table F-1 presents an inventory of the major roads providing access to and within the park as well as the new roads and circulation routes proposed as part of the draft general management plan (proposed action); existing and proposed parking areas associated with these roads are also inventoried. The two maps following the table indicate the locations of existing and proposed roads and parking areas.

Existing road descriptions include length, width, surface type, and physical condition and terrain. Also included are jurisdiction (FLHP funds can only be spent on roads under NPS jurisdiction through ownership and right-of-way agreement), estimates of use (SADT - seasonally adjusted average daily traffic), and function and classification (classifications are derived from the *Park Road Standards*; there are five classifications ranging from I, principal road, to V, administrative road).

Road proposals under the draft general management plan are categorized by proposed function and classification, projected SADT, recommended and proposed width, and surface type. Recommended widths were included to indicate the *Park Road Standards* minimum widths under specific road classifications. If the proposed width differs from the recommended width, it is usually to enhance resource protection or visitor experiences. Where proposed road data is included on the existing road portion of the table, it is enclosed in parentheses. Comments to explain actions to be taken are also included.

Cost estimates for all road work, including for the alternatives considered, are presented in appendix I, "Cost Estimates." The estimates are based on unit costs (per mile or acre) that were derived from actual costs for construction projects in similar areas with similar terrain. They are gross construction costs in 1990 dollars. Estimates for parking areas include costs for curbs, walks, fences, colored concrete, interpretive displays, sanitary facilities, and other appurtenances.

TABLE F-1: ROAD SYSTEM EVALUATION

Route/Segment No. & Name	EXISTING							PROPOSED ACTION					
	Road Length (miles) or Parking Capacity (vehicles)	Jurisdiction (miles)	Road Width* (feet) or Parking Lot Size (sq ft)	Surface Type	Physical Condition and Terrain	SADT	Function & Classification	Proposed Function & Classification	Projected SADT	Recommended Width* (Park Road Standards)	Proposed Width* or Parking Lot Size	Surface Type	Comments
Route 10, Existing Entrance Road	4.9	4.2 State 0.7 NPS	26 feet	Asphalt	Fair to good condition; flat terrain	150	Main park entrance, I						
Segment 1, Baker to Boundary	4.2	State						NA	NA	NA	NA	Asphalt	State maintenance for access to residences
Segment 2, Boundary to Baker Creek Road (Route 101)	0.2	NPS/State						Administrative access, V	NA	20 feet	26 feet	Asphalt	Change to route 406; gate at boundary; overlay when other work in area is done
Segment 3, Route 101 to Lehman Cave Visitor Center Parking Area (Route 901)	0.5	NPS					NA	NA	NA	NA	NA	NA	Obiterate
Route 11, Wheeler Peak Scenic Drive	11.8	NPS	22 feet	Asphalt	Fair condition, no shoulders, some edge cracking, isolated base failures because of drainage problems	150	Principal park road providing access to main park features, I	Principal park road; also main park entrance, I	185	20 feet		Asphalt	
Segment 1, Wheeler Peak Pullout/Trahead Parking Area (Route 900) to Upper Lehman Creek Campground (Route 202)	9.3				Mountainous terrain			Access to scenic, turnouts and trailheads, I	185		22 feet	Asphalt	Most scenic portion of road - avoid use of guardrail if possible; realign road at four major pullouts and construct retaining walls; rehabilitate existing road with base repair as needed.
Segment 2, Upper Lehman Creek Campground to Park Entrance	2.5 (Proposed 3.2)				Flat to rolling terrain			Access to main visitor facilities, I	185		26 feet	Asphalt	Realign lower portion along with Baker Creek road (route 100) as part of new construction; construct small bridge over Lehman Creek; incorporate segment of Baker Creek road into route 11 and pave; construct new section from previous route 100 to park boundary; rehabilitate rest of segment.

*Includes road shoulders

Route/Segment No. & Name	EXISTING							PROPOSED ACTION					
	Road Length (miles) or Parking Capacity (vehicles)	Juris- diction (miles)	Road Width* (feet) or Parking Lot Size (sq ft)	Surface Type	Physical Condition and Terrain	SADT	Function & Classi- fication	Proposed Function & Classi- fication	Projected SADT	Recom- mended Width* (Park Road Standards)	Proposed Width* or Parking Lot Size	Surface Type	Comments
(Segment 3, Existing Park Boundary to SR 487)	(Proposed 6.5)	(1.2 NPS) (7.3 BLM; 800-foot- wide NPS right-of- way)			(Flat to rolling terrain)			Main park entrance; access to visitor facilities and interpretive areas. I	185		26 feet	Asphalt	Construct new road with curvilinear align- ment emphasizing changing scenic views; align road corridor out of new visitor center view- shed; construct park entrance pullout (route 906), Kiou Basin pullout (route 106), and four additional 5- to 10-car pullouts; construct small bridge over Lehman Creek.
Route 100, Baker Creek Road	3.5	NPS	22 feet	Gravel	Fair to good condition; 50 ft. terrain	50	Access to campgrounds and trailhead. II						
Segment 1, Entrance Road (Route 10) to Milepost 0.5	0.5	NPS						Main park road. I	185	20 feet	26 feet	Asphalt	Rehabilitate base and pave to become part of route 11, segment 2 (main park road).
Segment 2, Milepost 0.5 to Baker Lake Trailhead	3.0	NPS						Access to campgrounds and trailhead. II	65	20 feet	22 feet	Asphalt	Rehabilitate existing base and pave.

EXISTING								PROPOSED ACTION					
Route/Segment No. & Name	Road Length (miles) or Parking Capacity (vehicles)	Jurisdiction (miles)	Road Width* (feet) or Parking Lot Size (sq ft)	Surface Type	Physical Condition and Terrain	SADT	Function & Classification	Proposed Function & Classification	Projected SADT	Recommended Width* (Park Road Standards)	Proposed Width* or Parking Lot Size	Surface Type	Comments
Route 101, Strawberry Creek Road	5.6	2.9 NPS 0.5 USFS 2.2 BLM	10-14 feet	Dirt	Fair condition; rolling terrain	<50	Access to primitive camping areas and trailheads, IV	Same, IV	<50	NA Primitive	Same	Gravel	Make accessible to 2WD vehicles; improve drainage and provide maintenance surfacing (2-4 inches gravel); widen only as needed to improve drainage, but maintain minimum width of 10 feet with passing turnouts; realign short segments where roads are in or cross drainage channels; armor drainage crossings with low water crossings (fords) or culvert pipes (when already present); construct or formalize trailhead parking (10 cars each at ends of all roads, some with corral facilities); delineate existing rustic campsites along roads and campgrounds at end of roads with gravel parking pads where applicable.
Route 102, Snake Creek Road	12.3	6.8 NPS 1.3 USFS 4.2 BLM	10-14 feet	Dirt/gravel	Fair condition; rolling terrain	<50	Access to primitive camping areas and trailheads, IV	Same, IV	<50	NA Primitive	Same	Gravel	
Route 103, Big Wash Road	9.4	2.9 USFS 6.5 BLM	10-14 feet	Dirt	Fair to poor condition; rolling terrain	<50	Primitive access to trailhead, IV	Same, IV	<50	NA Primitive	Same	Gravel	
Route 104, Lexington Arch Road	11.5	3.8 USFS 7.7 BLM	10-14 feet	Dirt	Fair condition; rolling terrain	<50	Primitive access to trailhead, IV	Same, IV	<50	NA Primitive	Same	Gravel	
Route 105, Mt. Washington Road	1.5		8-12 feet	Dirt	Fair to poor condition; mountainous terrain	<50	Primitive access to west side of park, IV	NA	NA	NA	NA	NA	Close road at park boundary and gate; restore scar. USFS might provide small parking area. NPS would not seek jurisdiction of road outside boundary.
(Route 106, Kious Basin Road)	(Proposed 1.4)	(0.1 NPS) (1.3 BLM)			(Rolling terrain)			Access to interpretive area and trailhead, II	150	20 feet	26 feet	Asphalt	Construct new road, 5- to 10-car parking area at interpretive area, and 15- to 20-car parking area (route 907) at trailhead.

Route/Segment No. & Name	EXISTING							PROPOSED ACTION					Comments
	Road Length (miles) or Parking Capacity (vehicles)	Juris- diction (miles)	Road Width* (feet) or Parking Lot Size (sq ft)	Surface Type	Physical Condition and Terrain	SADT	Function & Classi- fication	Proposed Function & Classi- fication	Projected SADT	Recom- mended Width* (Park Road Standards)	Proposed Width* or Parking Lot Size	Surface Type	
Route 200, Wheeler Peak Campground Road	0.9	NPS	14-18 feet two-way; 14 feet one-way (loops)	Asphalt	Fair condition; rolling terrain	<50	Campground access and circulation, III	Same, II	<50	18 feet two-way; 14 feet one-way	18 feet two-way; 14 feet one-way	Asphalt	Make two-way segments a consistent 18 feet wide and one-way segments not more than 14 feet; overlay existing road; do not change layout or character of area.
Route 201, Wheeler Peak Road Scenic Spur	0.2	NPS	22 feet	Gravel	Poor condition; flat terrain	100	Access to scenic/ interpretive area, III	Same, III	125	20 feet	22 feet	Asphalt	Rehabilitate severely deteriorated pavement; improve intersection alignment with route 11.
Route 202, Upper Lehman Creek Campground Road	0.8	NPS	14-18 feet two-way; 14 feet one-way (loop)	Asphalt	Poor to fair condition; rolling terrain	<50	Campground access and circulation, III	Same, III	<50	18 feet two-way; 14 feet one-way	18 feet two-way; 14 feet	Asphalt	Rehabilitate existing roads and provide consistent width at the few constricted areas; do not change layout or character of area.
Route 203, Lower Lehman Creek Campground Road	0.3	NPS	14 feet one-way (loop)	Asphalt	Poor to fair condition; rolling terrain	<50	Campground access and circulation, III	NA	NA	NA	NA	NA	Obliterate existing road and restore area to natural conditions.
Route 204, Baker Creek Campground Road	0.7	NPS	18 feet two-way; 12 feet one-way (loops)	Gravel	Poor to fair condition; flat terrain	<50	Campground access and circulation, III	Same, III	<50	18 feet two-way; 12 feet one-way	18 feet two-way; 12 feet one-way	Asphalt	Repair isolated base failures and pave; improve drainage; use existing widths and alignments.
Route 205, Headquarters Picnic Area Road	0.2	NPS	22 feet	Asphalt	Fair condition; flat terrain	<50	Access to picnic area, III	Adminis- trative, handicap, seasonal access to Lehman Cave interpretive center, III	<50	18 feet	22 feet	Asphalt	Convert picnic area to parking/sitting area with new access from Wheeler Peak Scenic Drive; use existing road for adminis- trative, handicap, and seasonal access to visitor center; rehab- ilitate existing road.
Route 206, Grey Cliffs Campground Road	1.4	NPS	20 feet two-way; 12-14 feet one-way	Gravel	Fair condition; flat to rolling terrain	<50	Campground access and circulation (overflow use only), III	Group campground access, III	<50	18 feet two-way; 12 feet one-way	18 feet two-way; 12 feet one-way	Asphalt	Convert west loop to group campground, and obliterate/restore other three loops; provide new short access to group area off Baker Creek road; rehabilitate base and pave; obliterate spur road along creek.

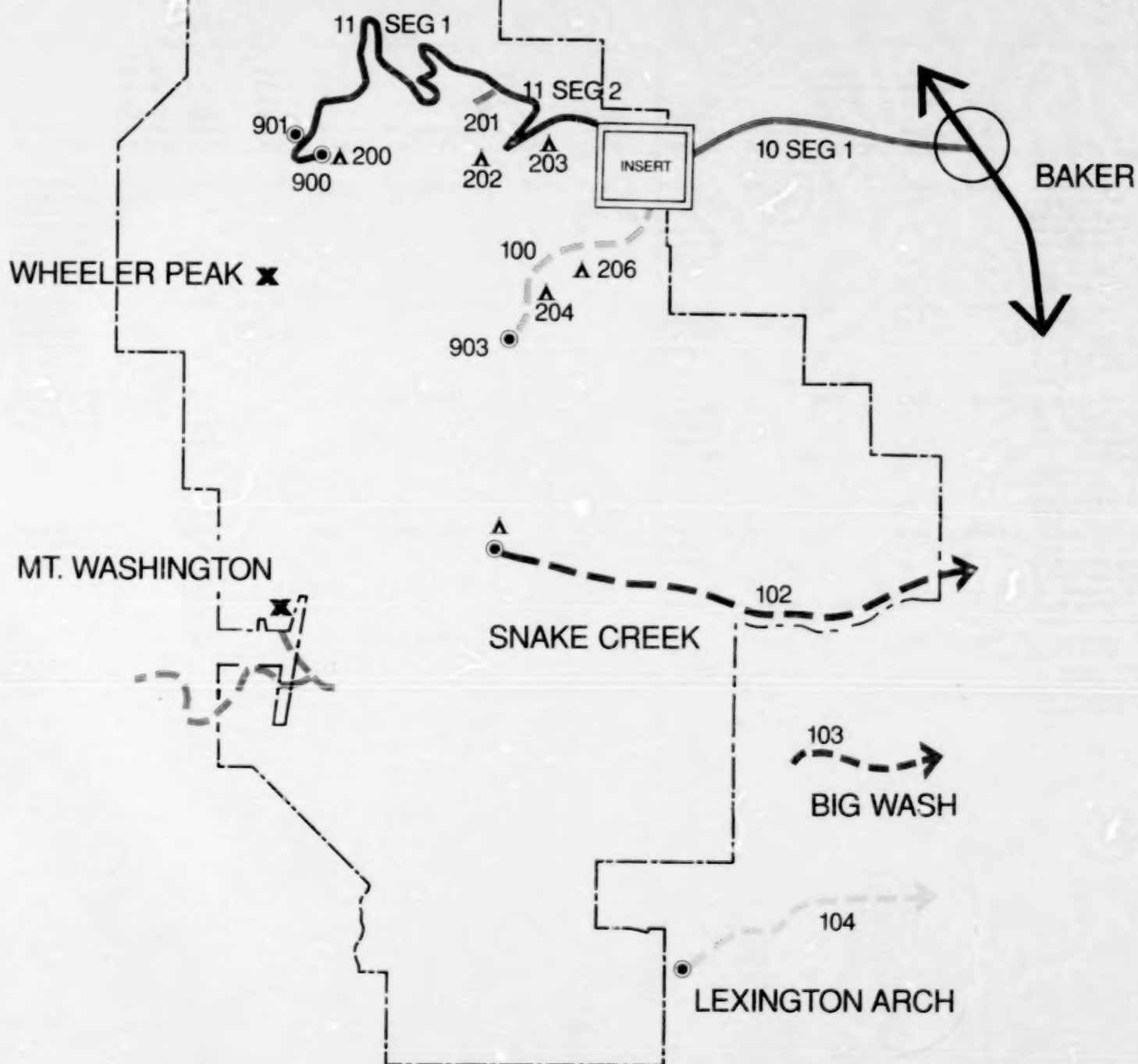
Route/Segment No. & Name	EXISTING							PROPOSED ACTION					
	Road Length (miles) or Parking Capacity (vehicles)	Juris- diction (miles)	Road Width* (feet) or Parking Lot Size (sq ft)	Surface Type	Physical Condition and Terrain	SADT	Function & Classi- fication	Proposed Function & Classi- fication	Projected SADT	Recom- mended Width* (Park Road Standards)	Proposed Width* or Parking Lot Size	Surface Type	Comments
(Route 207, Great Basin Visitor Center Road)	(0.7)	(NPS)			(Rolling terrain)			Access to new visitor center, II	150	20 feet	26 feet	Asphalt	Was routes 403 and 100, segment 2; convert narrow gravel road to new paved two-lane road.
(Route 208, Lehman Cave Spur Road)	(0.3)	(NPS)			(Rolling terrain)			Access to parking for Lehman Cave interpretive area, II	150	20 feet	26 feet	Asphalt	Construct spur road partially following an old road scar; construct a small bridge across Lehman Creek.
(Route 209, Lehman Flats Campground Road)	(1.0)	(NPS)						Campground access and circulation, III	<50	18 feet two-way; 14 feet one-way	18 feet two-way; 14 feet one-way	Asphalt	Design and construct for RV use.
Route 400, Lehman Cave Residential/ Maintenance Road	0.5	NPS	20 feet	Asphalt	Poor condition; flat terrain	<50	Access to and circulation within housing and maintenance area, V	Same, V	<50	18 feet	20 feet	Asphalt	Overlay circulation loops; obliterate and restore existing access from route 10; construct new access partially following old road scar from route 100, segment 2.
Route 401, Lehman Cave Water Tank Road	0.8	NPS	12 feet	Dirt	Fair condition; rolling terrain	5	Administrative access, V	Same, V	5	NA	12 feet	Dirt	No change.
Route 402, Wheeler Peak Drive Gravel Pit Road	0.1	NPS	12 feet	Dirt	Poor condition; flat terrain	5	Administrative access, V	NA	NA	NA	NA	NA	Obliterate road and restore entire area to natural conditions.
Route 403, Baker Ridge Pit Road	0.2	NPS	12 feet	Dirt	Poor condition; flat terrain	5	Administrative access, V	Public access to new Great Basin visitor center, II	150	20 feet	26 feet	Asphalt	Change to route 207; construct new paved road following existing alignment.
Route 404, Lehman Cave Sewage Lagoon Road	0.2	NPS	12 feet	Dirt	Fair condition; flat terrain	5	Administrative access, V	NA	NA	NA	NA	NA	Obliterate road and restore entire area to natural conditions after new sewage treatment facility is constructed.
Route 406, Old Entrance Road	(0.2)	(NPS)	(26 feet)	(Asphalt)	(Fair condition; flat terrain)	(150)	(Public access to Lehman Cave visitor center, I)	Adminis- trative access, V	5	18 feet	26 feet	Asphalt	Was route 10, segment 2 (entrance road); overlay when other work in the area is done; install gate at boundary.

Route/Segment No. & Name	EXISTING							PROPOSED ACTION					
	Road Length (miles) or Parking Capacity (vehicles)	Juris- diction (miles)	Road Width* (feet) or Parking Lot Size (sq ft)	Surface Type	Physical Condition and Terrain	SADT	Function & Classi- fication	Proposed Function & Classi- fication	Projected SADT	Recom- mended Width* (Park Road Standards)	Proposed Width* or Parking Lot Size	Surface Type	Comments
(Route 407, Baker Administrative Site Roads)								Access to and circulation within residential and maintenance area, IV	<50	18 feet	20 feet	Asphalt	Construct new roads when area is developed.
Route 900, Wheeler Peak Pullout/Tailhead Parking Area	8-10 vehicles	NPS	1,500 sq ft	Asphalt	Fair condition; mountainous terrain	NA	Public parking for interpretive area and trailhead, III	Same, III	NA	NA	10,000 sq ft	Asphalt	Relocate to new site northeast of existing site; design with tiered, separated bays and utilize existing vegetation for screening; construct for 50-vehicle capacity with potential for maximum expansion to 75 vehicles (development to include restrooms, information/orientation, and interpretation).
Route 901, Summit Trail Parking Area	10-12 vehicles	NPS	2,000 sq ft	Asphalt	Fair condition; flat terrain	NA	Public parking for trailhead, III	Same, III	NA	NA	2,000 sq ft	Asphalt	Overlay existing area when adjacent road work is done.
Route 902 Lehman Cave Visitor Center Parking Area	75 vehicles (two tiers with islands)	NPS	23,500 sq ft	Asphalt	Fair condition; rolling terrain	NA	Public parking for visitor center, III	Adminis- trative, handicap, seasonal parking, III	NA	NA	11,750 sq ft	Asphalt	Obliterate lower tier (35 spaces) and RV parking areas and restore to natural conditions; rehabilitate upper tier (35 vehicles).
Route 902, Baker Lake Trailhead Parking Area	75 vehicles (two tiers with islands)	NPS	23,500 sq ft	Asphalt	Fair condition; rolling terrain	NA	Public parking for visitor center, III	Adminis- trative handicap seasonal parking, III	NA	NA	11,750 sq ft	Asphalt	Obliterate lower tier (35 spaces) and RV parking areas and restore to natural conditions; rehabilitate upper tier (35 vehicles).
Route 903, Baker Lake Trailhead Parking Area	10-15 vehicles	NPS	3,000 sq ft	Gravel	Fair condition; flat terrain	NA	Public parking for trailhead, III	Same, III	NA	NA	3,000 sq ft	Asphalt	Pave when work on Baker Creek road (route 100) is done.

Route/Segment No. & Name	EXISTING								PROPOSED ACTION				
	Road Length (miles) or Parking Capacity (vehicles)	Jurisdiction (miles)	Road Width* (feet) or Parking Lot Size (sq ft)	Surface Type	Physical Condition and Terrain	SADT	Function & Classification	Proposed Function & Classification	Projected SADT	Recommended Width* (Park Road Standards)	Proposed Width* or Parking Lot Size	Surface Type	Comments
Route 96-4, Lehman Cave Picnic Area Parking (Cave Staging Area Parking)	20 vehicles	NPS	4,000 sq ft	Paved	Fair condition; flat terrain	NA	Public parking for picnic area, III	Public parking for Lehman Cave and interpretive center, III	NA	NA	25,000 sq ft	Asphalt	Construct new 70-car/30-bus/RV parking area on existing area (development to include picnic area, restrooms, and cave ticket sales kiosk).
(Route 905, Great Basin Visitor Center Parking Area)		(NPS)			(Rolling terrain)			Public parking for new visitor center, III		NA	13,000 sq ft	Asphalt	Construct new 50-car/5-bus/RV parking area on site of existing borrow area at end of new route 207
(Route 906, Park Entrance Pullout Parking Area)		(BLM; NPS right-of-way)			(Flat terrain)			Public parking for information/ orientation and photos, III	NA	NA	5,000 sq ft	Asphalt	Construct new 15- to 20-car parking area near junction of Nevada 487 and new route 11, segment 3 (park entrance road) (development to include entrance sign and kiosks).
(Route 907, Kiowa Basin Parking Areas)		(NPS)		NA	(Rolling terrain)			Public parking for trailhead and interpretive area, III	NA	NA	5,000 sq ft	Asphalt	Construct new 5- to 10-car and 15- to 20-car parking areas at end of new route 106 (development to include information kiosks and restroom).
(Route 908, Baker Orientation Center Parking Area)		(NPS)		NA	(Flat terrain)			Public parking for orientation facility, III	NA	NA	7,000 sq ft	Asphalt	Construct a new 25-car/5-bus/RV parking area on the administrative site west of Nevada 487 near the town of Baker.



STRAWBERRY CREEK



ROAD SYSTEM EVALUATION EXISTING CONDITIONS

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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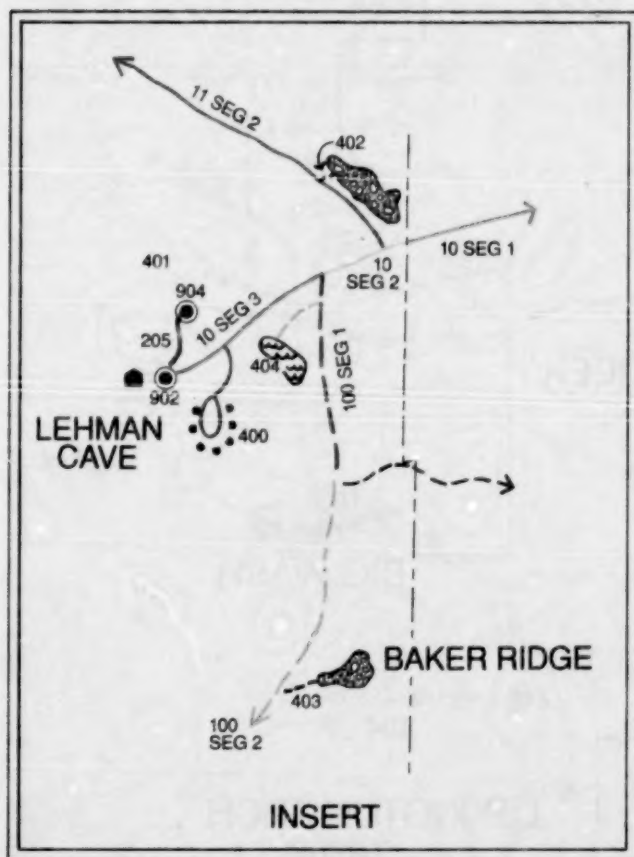
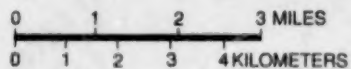
-  GRAVEL PIT
-  SEWAGE LAGOON
-  BUILDING
-  PARKING AREA
-  CAMPGROUND
-  PAVED ROAD
-  DIRT/GRAVEL ROAD
-  BOUNDARY

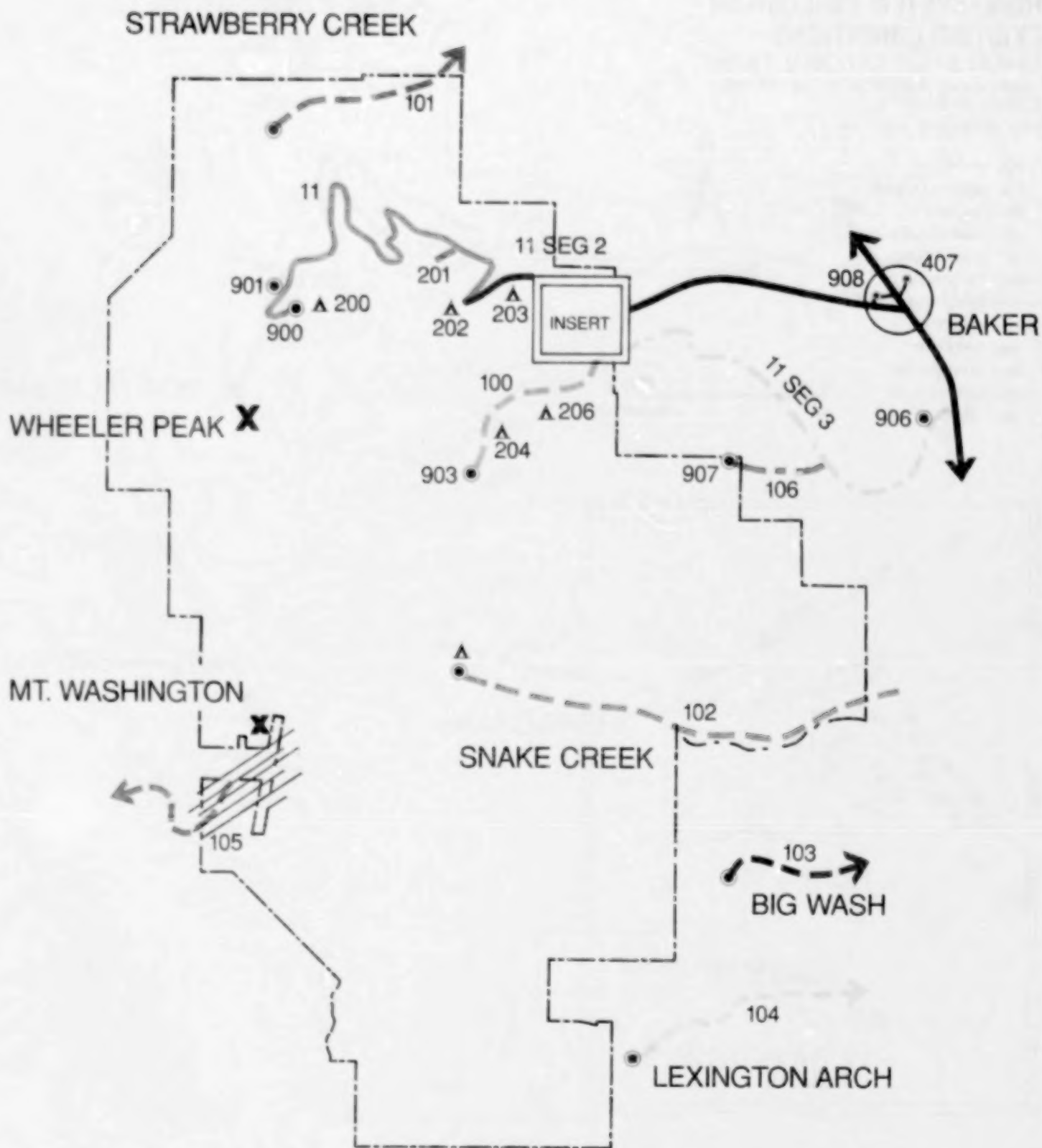
100 = DIRT ROAD

200 = CAMPGROUND

400 = SERVICE ROAD

900 = PARKING LOT





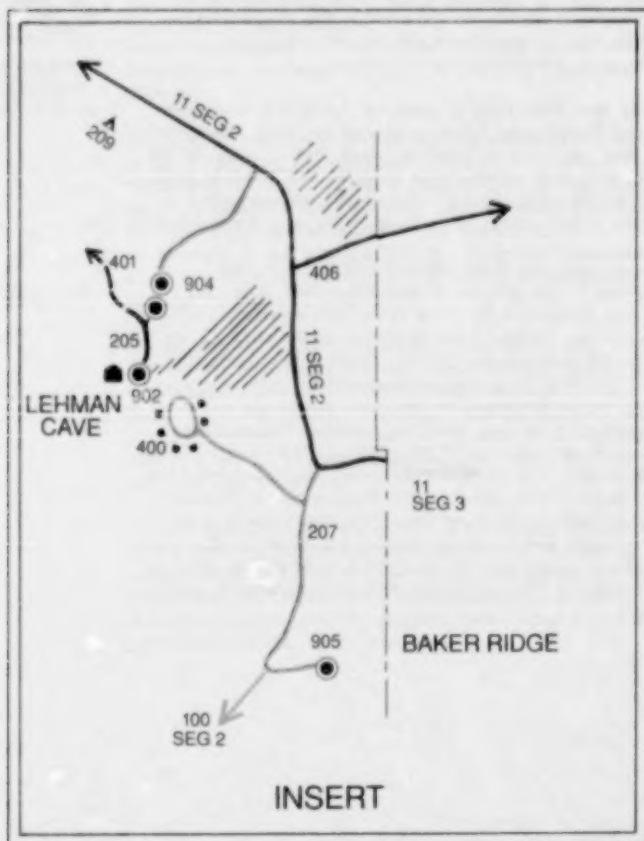
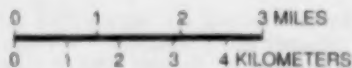
ROAD SYSTEM EVALUATION PROPOSED ACTION

GREAT BASIN NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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-  BUILDING
-  PARKING AREA
-  CAMPGROUND
-  PAVED ROAD
-  DIRT/GRAVEL ROAD
-  PROPOSED PAVED ROAD
-  OBLITERATE
-  BOUNDARY
- 100 = DIRT ROAD
- 200 = CAMPGROUND
- 400 = SERVICE ROAD
- 900 = PARKING LOT



APPENDIX G: COMPLIANCE STATUS

Documentation of National Park Service compliance with federal and state laws and regulations is incorporated in the text of this *Draft General Management Plan/Development Concept Plans/Environmental Impact Statement*. Compliance with nine major federal laws, executive orders, and regulations and associated state regulations is summarized here.

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

This *Draft General Management Plan/Development Concept Plans/Environmental Impact Statement* provides public disclosure of the planning and decision-making process and the potential environmental consequences of the proposed action and alternatives, as required by the National Environmental Policy Act. The draft document will be available for public review and comment for 90 days. Agency and public comments will then be considered, the draft plan and environmental analysis will be reviewed in light of those comments, and a final general management plan and environmental impact statement will be published, which will respond individually or through summaries to all substantive comments received. Thirty days following publication of the final plan and environmental impact statement, a record of decision will be published to document the final decision and the alternatives considered, to identify the environmentally preferable alternative, and to describe whether all practicable means of avoiding environmental harm as a result of implementing the selected action have been adopted. At that time the actions in the final plan will be implemented.

ENDANGERED SPECIES ACT OF 1973

Section 7 of the Endangered Species Act directs all federal agencies to utilize their authorities in furtherance of the purposes of the act by carrying out programs for the conservation of endangered or threatened species. Federal agencies are required to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat.

Informal consultation under section 7 of the Endangered Species Act was initiated with the U.S. Fish and Wildlife Service in February 1988 with a request for a list of species potentially within the project area. (Correspondence has been maintained with Fish and Wildlife Service on a yearly basis since this effort was initiated). A similar request was sent to the Nevada Natural Heritage Program and the Nevada Department of Wildlife. Through subsequent correspondence

with these agencies and organizations, several particularly sensitive species residing within the park were identified. Two species known or suspected to occur within the park are listed on the federal endangered species list. Nine species are candidate species for listing. The park also contains two additional species that are listed on the state or Nevada Natural Heritage Program list as endangered, threatened, or sensitive (see table 1 in the text). There is no designated critical habitat within Great Basin National Park for any federally listed species.

It is the conclusion of the National Park Service that the draft proposed action described in this document would not adversely affect any federally listed or candidate species or critical habitat.

Executive Orders 11988 and 11990 direct federal agencies to enhance floodplain and wetland values, to avoid development in floodplains and wetlands whenever there is a practicable alternative, and to avoid to the extent possible adverse impacts associated with the occupancy or modification of floodplains and wetlands.

EXECUTIVE
ORDER 11988
("FLOODPLAIN
MANAGEMENT")
AND EXECUTIVE
ORDER 11990
("PROTECTION
OF WETLANDS")

Neither flash-flood hazard areas nor floodplains have been mapped for the park. The various riparian areas associated with Strawberry Creek, Lehman Creek, Baker Creek, Snake Creek, and other creeks within the park are assumed to be within the floodplain. Most of the creeks and drainages in the park are subject to flash flooding during summer months.

Approximately half of the existing campgrounds and campsites in the park are adjacent to creeks. The plan proposes to remove 34 of the Gray Cliffs campsites, which lie within the confined narrows portion of Baker Creek, as well as the entire Lower Lehman Creek campground (11 sites). The majority of the existing campgrounds, where escape routes are good and the flood events are not expected to be severe, would be retained. The proposed Lehman Flats campground (50 sites) would be built outside the floodplain. The proposed entrance road alignment would cross Baker Creek; however, the impacts on the floodplain would be minimal because the road would cross at a 90 degree angle and would not parallel the creek on either side. The bridge would also be designed to minimize its effect on water flow. All other proposed developments and all existing

developments that would remain under the proposed action would be outside the floodplain.

In addition to the riparian areas discussed above, the park has numerous wetlands including subalpine meadows, lakeshores, and isolated wetlands associated with numerous springs and seeps on mountain slopes. With the exceptions noted above, no proposed actions would affect wetlands.

COUNCIL ON ENVIRONMENTAL QUALITY MEMORANDUM ON PRIME OR UNIQUE FARMLAND SOILS

An August 11, 1980, memorandum from the Council on Environmental Quality requires federal agencies to assess the effects of their actions on soils classified by the Soil Conservation Service as prime or unique farmlands. No such soils occur within the park.

NATIONAL HISTORIC PRESERVATION ACT OF 1966

As required by section 106 of the National Historic Preservation Act, the *Draft General Management Plan/Development Concept Plans/Environmental Impact Statement* is being reviewed by the Nevada historic preservation officer and the Advisory Council on Historic Preservation, in accordance with the council's regulations (36 CFR 800).

Section 106 Consultation

On July 21, 1987, the National Park Service sent a letter to Nevada historic preservation officer Roland Westergard, requesting that he designate a person from his staff to serve as a key contact for this planning effort. On July 24, 1987, the Mr. Westergard designated Alice Becker, staff archeologist for the Nevada Division of Historic Preservation and Archeology, as the key contact for the Great Basin National Park planning effort.

On January 27, 1988, the National Park Service sent a letter to the Advisory Council and the Nevada historic preservation officer stating that the general management plan for Great Basin was being initiated and invited their participation at appropriate stages in the planning process. A copy of the task directive for this general management plan effort was enclosed with each letter.

On February 9, 1988, Robert Fink of the Advisory Council sent a letter to the National Park Service acknowledging receipt of the task directive and stating that the council appreciated the opportunity to participate in the planning effort as established by the programmatic memorandum of agreement (PMOA). The letter stated:

Our initial thoughts after reading the document are that available information regarding cultural resources in the park should be gathered and synthesized as a first step in the planning effort. Historic and prehistoric sites should be considered together to facilitate conformity of management considerations in accordance with Stipulation 6 of the PMOA. [A historic resource study and an archeological overview were completed in 1990 as part of this planning effort.]

On February 10, 1988, the National Park Service contacted by Nevada's state historic preservation officer by telephone to confirm that the January 27th initiation letter and the task directive had been received. The preservation officer had received the letter and task directive enclosure and agreed to participate in the planning process.

On March 1, 1988, the National Park Service sent a letter inviting the state historic preservation officer to participate in a scoping session on the Great Basin National Park general management plan. This session was held in Carson City, Nevada, on March 29, 1988. Ms. Kate Kuranda attended the scoping session along with the other representatives listed in the "Consultation and Coordination" section.

In October 1988 a Great Basin *Alternatives Workbook* was sent to both the state historic preservation officer and the Advisory Council of Historic Preservation. On October 20, 1988, the council sent a letter to the National Park Service acknowledging that it had received the alternatives workbook on October 7. In the letter the council stated:

At this point, the Council cannot comment on any of the alternatives because of the stated lack of information on historic properties within the Park. We are keenly interested and would like to review a copy of the study effort that will provide the basic data for your planning effort.

On December 2, 1988, Nevada Governor Bryan sent a letter to the National Park Service that provided the state's comments on the *Alternatives Workbook*. The governor stated that the comments were developed through a consensus-building process among those state agencies designated as key contacts, which included the Nevada Division of Historic Preservation and Archeology. The state's comments pertaining to cultural resources were as follows:

The Park Service should realize that increased visitation to the park will lead to impacts to historic properties

within the park boundaries. Accordingly, the Park Service must conduct sample surveys to identify classes of properties that might be affected by increased visitor use, and decide on the appropriate strategies for preservation or mitigation. In reference to the historic orchard in the Park, we would agree that the orchard area should be reestablished, however, we question whether enough is known about the orchard (a National Register Property) to restore it accurately. In any event, coordination with our State Historic Preservation Officer will be required before any major developments are initiated.

The National Park Service requested a meeting with the various state agencies to discuss the governor's comments. This meeting was held at 9:00 a.m., April 12, 1989, in Carson City, Nevada. Ms. Karen Kuranda represented the state historic preservation officer but raised no questions concerning cultural resource issues. Previously, on March 21, 1989, the Park Service had contacted Ms. Kuranda to suggest that the Great Basin planning team meet with the state historic preservation officer on the afternoon of April 12, 1989 (following the morning meeting described above), for a focused discussion on cultural resources issues. Ms. Kuranda declined stating that the morning meeting would provide sufficient opportunity to discuss cultural issues.

Before publication of the final GMP/EIS the Park Service will consult with the Nevada state historic preservation officer to determine the status of section 106 compliance on undertakings in conformance with stipulation E.4 of the August 15, 1990, programmatic agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers. The results of that consultation will be included in the final GMP/EIS.

Section 110
and
Executive
Order 11593

Historic structures were evaluated in accordance with section 110 of the National Historic Preservation Act to determine eligibility for inclusion on the National Register of Historic Places. Although the park has not been systematically surveyed for historic resources, 26 such sites have been identified as part of the 1990 Great Basin *Historic Resource Study*. The majority of these sites are related to mining and agriculture/ranching themes. Three of the 26 sites were placed on the National Register of Historic Places in 1975 – the Lehman orchard, Lehman aqueduct, and Rhodes cabin. After careful evaluation, documented in the *Historic Resource Study*, this general management plan recommends that one additional site – the Osceola ditch and associated structures

– be nominated to the National Register of Historic Places. Although the *Historic Resource Study* determined that the remaining historic sites were not of National Register quality based on their historical significance, the study acknowledged their value as assets to the park's interpretive program. In addition, the 1990 *Archeological Survey and Site Assessment at Great Basin National Park* found 16 of the 26 historic sites eligible for nomination to the National Register based on their archeological value (potential to yield scientific information).

The Western Archeological Center of the National Park Service inventoried approximately 2 percent of the park to provide information for the general management plan effort. The preliminary inventory findings, which are documented in the *Archeological Survey and Site Assessment at Great Basin National Park*, identified 30 prehistoric sites, 40 isolated finds, and more than 70 pieces of isolated chipped stone debitage. In addition, the *Archeological Survey of the Baker Guard Station* identified four archeological sites on that property. All sites will be evaluated in consultation with the Nevada historic preservation officer to determine their eligibility for listing on the National Register.

The draft general management plan has emphasized the need to eliminate most nonessential development from one of the park's prime resource areas – the Lehman Caves/Lower Lehman Creek/Baker Ridge vicinity. The majority of NPS housing, all maintenance and sewage treatment facilities, and administration would be moved out of this prime resource area to an 80-acre location near the town of Baker. This action would enhance scenic quality, improve visitor experiences, and reduce impacts on the karst topography underlying most of this prime resource area. The draft plan does propose that three essential new developments (the Great Basin visitor center and parking area on Baker Ridge, the parking area for the rehabilitated Lehman Cave interpretive center, and the 50-site campground at Lehman Flats) be developed within this prime resource area to fulfill the purpose of the new national park, improve visitor experiences, provide a quality interpretive program, and better accommodate the projected increases in visitation. Because there is a very limited amount of available space suitable for development within this prime resource area, there are few options for locating these developments. The locations proposed for the essential developments have the potential to impact approximately 11 known archeological sites and 30 known archeological finds. The proposed 80-acre NPS administrative, maintenance, and housing site near the town of Baker has the potential to

impact approximately four archeological sites. Where possible, proposed developments would be located and designed to avoid disturbance to archeological sites and finds. If an archeological site or find could not be avoided, all appropriate mitigation procedures would be developed in consultation with the Nevada historic preservation officer and the Advisory Council on Historic Preservation. If a discovery was made during construction, the Park Service would cease any activity affecting the discovery and would consult in accordance with 36 CFR 800.11.

**ARCHEOLOGICAL
RESOURCES
PROTECTION
ACT OF 1979**

The National Park Service intends to meet its obligations under the Archeological Resources Protection Act in all activities at Great Basin National Park. No archeological resources will be excavated without proper permits. Unauthorized excavation, removal, damage, alteration, or defacement of archeological resources will be prosecuted. All archeological resource collections and data will be preserved. Archeological site data will remain confidential.

In accordance with the American Indian Religious Freedom Act (PL 95-341) and the "Native American Relationships Management Policy of the National Park Service" (52 FR 35674), the National Park Service has identified the relevant native American groups who might use or have direct or indirect interest in the park. As described in the "Consultation and Coordination" section, consultations have taken place with or been offered to the Ely Tribal Colony Council, the Duckwater Tribal Council, and the Paiute Tribal Council (Cedar City). The Park Service as a matter of policy will be as unrestrictive as possible in permitting native American access to and use of any identified traditional sacred resources for traditional ceremonies. It is the intent of the Park Service to establish and promote good relations with the three native American groups that may have an interest in the park.

**AMERICAN
INDIAN
RELIGIOUS
FREEDOM
ACT OF
1979**

APPENDIX H: STAFFING REQUIREMENTS

As of 08/31/90

EXISTING STAFFING

Position	Position Title	Grade	Work Year Authorized
8420-01	Superintendent	GM-13	1.00
8420-02	Administrative Officer	GS-09	1.00
8420-04	Personnel Assistant	GS-07	1.00
8420-10	Chief I&RM	GS-12	1.00
8420-12	Resource Management Specialist	GS-09	1.00
8420-20	Supervisory Park Ranger (Interpretation)	GS-09	1.00
8420-21	Park Ranger (Interpretation)	GS-07	1.00
8420-50	Supervisory Park Ranger (Visitor Protection)	GS-09	1.00
8420-60	Facility Manager	GS-11	1.00
8420-70	Maintenance Mechanic Foreman	WS-07	1.00
8420-71	Maintenance Worker (B&U)	WG-08	1.00
8420-72	Utility System Operator	WG-08	1.00
8420-80	Engineering Equipment Operator Foreman	WS-08	1.00
8420-81	Motor Vehicle Operator	WG-06	.93
8420-505	Administrative Technician	GS-05	1.00
8420-511	Secretary	GS-05	1.00
8420-512	Range Technician	GS-07	.36
8420-513	Park Ranger (Resource Mgmt.)	GS-05	.16
8420-514	Physical Science Technician	GS-05	.40
8420-522	Park Ranger (Interpretation)	GS-05	.48
8420-523	Park Ranger (Interpretation)	GS-05	.40
8420-524	Park Ranger (Interpretation)	GS-05	.48
8420-525	Park Ranger (Interpretation)	GS-05	.37
8420-527	Park Ranger (Interpretation)	GS-05	.33
8420-530	Park Ranger (Interpretation)	GS-04	.93
8420-531	Park Ranger (Interpretation)	GS-04	.87
8420-532	Park Ranger (Interpretation)	GS-04	.51
8420-533	Park Ranger (Interpretation)	GS-04	.33
8420-535	Park Ranger (Interpretation)	GS-04	.45
8420-536	Park Ranger (Interpretation)	GS-04	.35
8420-537	Park Ranger (Interpretation)	GS-04	.62
8420-539	Park Ranger (Interpretation)	GS-04	.97
8420-540	Park Ranger (COOP)	GS-05	.39
8420-545	Park Ranger (Interpretation)	GS-03	.30
8420-550	Park Ranger (Visitor Protect.)	GS-05	.54
8420-551	Park Ranger (Visitor Protect.)	GS-05	.80
8420-557	Forestry Technician	GS-04	.40
8420-558	Forestry Technician	GS-04	.39
8420-559	Forestry Technician	GS-04	.37
8420-560	Program Clerk	GS-05	1.00
8420-569	Motor Vehicle Operator	WG-05	.94
8420-574	Maintenance Worker	WG-04	1.00
8420-575	Maintenance Worker	WG-04	.31
8420-576	Laborer	WG-03	.41
8420-580	Engineering Equipment Operator	WG-09	1.00
8420-582	Automotive Worker	WG-08	.88
8420-583	Motor Vehicle Operator	WG-04	.35
8420-588	Maintenance Worker	WG-08	.37
8420-589	Maintenance Worker	WG-08	.52
8420-590	Maint. Worker/MVO Op. Leader	WG-05/WL-04	1.00
	Laborer	WG-03	.31
	Laborer	WG-03	.31
	Laborer	WG-03	.31
	Laborer	WG-03	.31
	Laborer	WG-03	.31
	Laborer	WG-03	.31

PROPOSED ADDITIONAL STAFFING - PROPOSED ACTION

Permanent Additional	Grade	Work Year Authorized
Research Scientist	GS/GM-12/13	1.0
Computer Programmer Analyst	GS-07/09	1.0
Resource Management Technician	GS-07	1.0
Range Conservationist ¹	GS-07/09	1.0
Park Ranger (Visitor Protection)	GS-05/07	1.0
Park Ranger (Interpretation)	GS-07	1.0
Purchasing Agent	GS-05/06	1.0
Secretary	GS-05	1.0
Secretary ²	GS-C5	1.0
Administrative Technician ³	GS-05	1.0
Program Clerk ⁴	GS-05	1.0
Maintenance Mechanic - 2 positions	WG-09	1.0/each
Maintenance Worker ⁵	WG-04	1.0
Maintenance Worker	WG-04	1.0
Maintenance Worker	WG-07	1.0
Engineering Equipment Operator ⁶	WG-09	1.0
Engineering Equipment Operator	WG-09	1.0
Automotive Worker ⁷	WG-08	1.0
Maint. Worker/MVO Op. Leader ⁸	WG-05/WL-04	1.0
STF Permanent		
Clerk-Typist (Administration)	GS-03	0.8
Clerk-Typist (I&RM)	GS-03	0.8
Library Technician	GS-07	0.8
Range/Forestry Technician - 2 positions	GS-05	0.8/each
Seasonal/Temporary		
Range/Forestry Technician - 2 positions	GS-05	0.5/each
Park Ranger (Interpretation) - 6 positions	GS-05	0.5/each
Park Ranger (Interpretation) - 6 positions	GS-04	0.5/each
Park Ranger (Resource Management)	GS-05	0.5
Park Ranger (Backcountry) - 2 positions	GS-05	0.5/each
Laborer (Roads and Trail) - 3 positions	WG-03	0.5/each
Motor Vehicle Operator - 10 positions	WG-04	0.5/each

1. Replaces temporary position 8420-512

2. Replaces temporary position 8420-511

3. Replaces temporary position 8420-505

4. Replaces temporary position 8420-560

5. Replaces temporary position 8420-574

6. Replaces temporary position 8420-580

7. Replaces temporary position 8420-582

8. Replaces temporary position 8420-590

DESCRIPTION OF WORK TO BE PERFORMED BY ADDITIONAL STAFF - PROPOSED ACTION

**DIVISION OF
MANAGEMENT
AND
ADMINISTRATION**

Secretary GS-05 FTE 1.0

This position would be needed to assist the superintendent with correspondence, scheduling, research, and coordination for increased park projects.

Purchasing Agent GS-05/06 FTE 1.0

This position would be needed to prepare and process purchasing documents. A greatly increased level of purchasing and contracting would be necessary as the park operations expand.

Administrative Technician GS-05 FTE 1.0

This is currently a temporary position funded on a yearly basis. It would become permanent full time. There would be an increase in administrative workload due to the increase in staff and budget. This position would assist the administrative officer with housing, budget, property, timekeeping, travel, and administrative functions.

Clerk-Typist GS-03 FTE 0.8

This position would be required to assist with the seasonal increase in clerical work including correspondence, filing, employee processing, and records management.

**DIVISION OF
VISITOR
SERVICES
AND RESOURCE
MANAGEMENT**

Research Scientist GS/GM-12/13 FTE 1.0

This position would be the global climate change coordinator for research in the park. The incumbent would coordinate and conduct ongoing research.

Computer Programmer Analyst GS-07/09 FTE 1.0

This position would manage automatic data processing for the entire park, which would include assembling and operating the geographic information system for resource management and research.

Resource Management Technician GS-07 FTE 1.0

This position would focus on wildlife concerns and abiotic resources. Research would be conducted on the wildlife component of grazing or browsing to gain an understanding of range management in the park.

Range Conservationist GS-07/09 FTE 1.0

This position would replace temporary position 8420-512. The position is necessary to manage and monitor livestock grazing in the park and implement the allotment management plans.

Secretary GS-05 FTE 1.0

This is currently a temporary position funded on a yearly basis. It would become permanent full time. This position is necessary to provide the clerical assistance needed by the division. The secretary assists the Chief of I&RM with correspondence, filing, administrative research, division payroll, dispatching, and budget.

Park Ranger (Visitor Protection) GS-05/07 FTE 1.0

This position would be required to provide essential visitor support services including wildland fire suppression, search and rescue, law enforcement, and emergency medical services.

Park Ranger (Interpretation) GS-07 FTE 1.0

This position would be necessary because of the increase in seasonal interpretive staff needed to operate the new visitor center and orientation center. This position would provide on-line supervision and coordination of the seasonal staff and program.

Library Technician GS-07 FTE 0.8

This position would be necessary to organize and expand the reference libraries, conduct literature searches, and maintain the museum collection. The position would handle the curation of natural and cultural collections including a repository of bristlecone pine literature and research.

Clerk-Typist GS-03 FTE 0.8

This position would assist the division with the seasonal increase in correspondence, filing, payroll, and processing of reports.

Range/Forestry Technicians GS-05 FTE 1.6

These two positions would assist the range conservationist and resource management technician with research projects on wildlife, abiotic resources, and range management.

**Park Ranger (Resource Management - Seasonal)
GS-05 FTE 0.5**

This position would replace temporary position 8420-512. The position is necessary to manage and monitor livestock grazing in the park and implement the allotment management plans.

Park Ranger (Backcountry - Seasonal) GS-05 FTE 1

These two seasonal positions would patrol the backcountry and provide visitor assistance. They would provide essential visitor services including wildland fire suppression, search and rescue, law enforcement, and emergency medical services.

Range/Forestry Technicians (Seasonal) GS-05 FTE 3.0

These two seasonal positions would work in the backcountry to monitor range vegetation, fire fuels, livestock movements, and visitor use impacts. They would construct range improvements and revegetate old mining sites and access roads.

Park Ranger (Seasonal) GS-05 FTE 3.0

Park Ranger (Seasonal) GS-04 FTE 3.0

These positions would be required to provide a full range of visitor services because of the expanded operation at the new visitor center and orientation center in Baker. These positions are necessary to provide a full-week operation at the new facilities and interpretation of the Great Basin physiographic region.

**DIVISION OF
MAINTENANCE**

Maintenance Mechanic WG-09 FTE 2.0

These two positions would be necessary because of the increased amount of development, including housing. Journeyman are essential for the maintenance of these buildings.

Program Clerk GS-05 FTE 1.0

This is currently a temporary position funded on a yearly basis. It would become permanent full time. The position assists the facility manager with data input for the maintenance management system, budget, imprest cashier, payroll and secretarial duties.

Automotive Worker WG-08 FTE 1.0

This is currently a temporary position funded on a yearly basis. It would become permanent full time. The position is necessary because of the large fleet of vehicles maintained in the park. More vehicles would be added as the operation expands.

Engineering Equipment Operator WG-09 FTE 2.0

One of these positions is currently a temporary position funded on a yearly basis. With the increase in roads, two full-time equipment operators would be needed to assist the road crew in the summer and be the primary operators of the snow removal equipment.

Maintenance Worker WG-04 FTE 2.0

One of these positions is currently a temporary position funded on a yearly basis. With the increased number of buildings, two janitor/groundskeepers would be needed to clean all the facilities on a yearly basis.

Maintenance Worker WG-07 FTE 1.0

This position would be necessary because of the increased size of the water systems. This position would assist the utility systems operator.

**Maintenance Worker/MVO Operator Leader
WG-05/WL-04 FTE 1.0**

This position is currently a temporary position funded on a yearly basis. It would become permanent full time. The position would be the trail leader during the summer. During the winter the incumbent would assist the maintenance mechanics with buildings and utilities needs.

Laborer (Seasonal) WG-03 FTE 1.5

These positions would be necessary to construct and maintain the trails and roads in the park. Because of the increased trail mileage, two working crews would be required.

Motor Vehicle Operator (Seasonal) WG-04 FTE 5.0

These positions would be necessary because of the increased number of facilities and the need to drive to each one of the buildings to perform cleaning and routine maintenance.

PROPOSED ADDITIONAL STAFFING - ALTERNATIVE A

Permanent Additional	Grade	Work Year Authorized
Research Scientist	GS/GM-12/13	1.0
Computer Programmer Analyst	GS-07/09	1.0
Resource Management Technician	GS-07	1.0
Range Conservationist ¹	GS-07/09	1.0
Purchasing Agent	GS-05/06	1.0
Secretary	GS-05	1.0
Secretary ²	GS-05	1.0
Program Clerk ³	GS-05	1.0
Maintenance Mechanic	WG-09	1.0
Maintenance Worker ⁴	WG-04	1.0
Engineering Equipment Operator ⁵	WG-09	1.0
STF Permanent		
Clerk-Typist (Administration)	GS-03	0.8
Park Ranger (Visitor Protection)	GS-05/07	0.8
Park Ranger, Lead Interpreter	GS-06	0.8
Automotive Worker ⁶	WG-08	0.8
Maint. Worker/MVO Op. Leader ⁷	WG-05/WL-04	0.8
Seasonal/Temporary		
Library Technician	GS-07	0.8
Laborer (Roads and Trail) - 2 positions	WG-03	0.5/each
Motor Vehicle Operator - 2 positions	WG-04	0.5/each

-
1. Replaces temporary position 8420-512
 2. Replaces temporary position 8420-511
 3. Replaces temporary position 8420-560
 4. Replaces temporary position 8420-574
 5. Replaces temporary position 8420-580
 6. Replaces temporary position 8420-582
 7. Replaces temporary position 8420-590

PROPOSED ADDITIONAL STAFFING – ALTERNATIVE B

Permanent Additional	Grade	Work Year Authorized
Research Scientist	GS/GM-12/13	1.0
Computer Programmer Analyst	GS-07/09	1.0
Resource Management Technician	GS-07	1.0
Range Conservationist ¹	GS-07/09	1.0
Purchasing Agent	GS-05/06	1.0
Secretary	GS-05	1.0
Secretary ²	GS-05	1.0
Administrative Technician ³	GS-05	1.0
Program Clerk ⁴	GS-05	1.0
Maintenance Mechanic – 2 positions	WG-09	1.0/each
Maintenance Worker ⁵	WG-04	1.0
Maintenance Worker	WG-04	1.0
Maintenance Worker	WG-07	1.0
Engineering Equipment Operator ⁶	WG-09	1.0
STF Permanent		
Clerk-Typist (Administration)	GS-03	0.8
Park Ranger (Visitor Protection)	GS-05/07	0.8
Park Ranger (Interpretation)	GS-07	0.8
Automotive Worker ⁷	WG-08	0.8
Maint. Worker/MVO Op. Leader ⁸	WG-05/WL-04	0.8
Seasonal/Temporary		
Library Technician	GS-07	0.8
Range/Forestry Technician – 2 positions	GS-05	0.5/each
Park Ranger (Interpretation) – 2 positions	GS-05	0.5/each
Park Ranger (Interpretation) – 2 positions	GS-04	0.5/each
Park Ranger (Resource Management)	GS-05	0.5
Park Ranger (Backcountry) – 3 positions	GS-05	0.5/each
Laborer (Roads and Trail) – 5 positions	WG-03	0.5/each
Motor Vehicle Operator – 4 positions	WG-04	0.5/each

1. Replaces temporary position 8420-512
2. Replaces temporary position 8420-511
3. Replaces temporary position 8420-505
4. Replaces temporary position 8420-560
5. Replaces temporary position 8420-574
6. Replaces temporary position 8420-580
7. Replaces temporary position 8420-582
8. Replaces temporary position 8420-590

PROPOSED ADDITIONAL STAFFING – ALTERNATIVE C

Changes To Existing Staff – The following positions would be increased in grade or the title changed (the new grade and/or title are listed):

Position	Title	New Grade
8420-01	Superintendent	GM-14
8420-02	Administrative Officer	GS-11
8420-10	Chief Ranger	GS-12
8420-20	Chief of Interpretation	GS-12
8420-21	Assistant Chief of Interpretation	GS-09
8420-60	Chief of Maintenance	GS-12
8420-70	Maintenance Mechanic Foreman	WS-09
8420-80	Engineering Equipment Operator Foreman	WS-09

Permanent Additional	Grade	Work Year Authorized
Assistant Superintendent	GM-13	1.0
Research Scientist	GS/GM-12/13	1.0
Computer Programmer Analyst	GS-07/09	1.0
Resource Management Technician	GS-07	1.0
Range Conservationist ¹	GS-07/09	1.0
Park Ranger (Visitor Protection)	GS-05/07	1.0
Park Ranger (Interpretation)	GS-07	1.0
Park Ranger (West Visitor Protection)	GS-09	1.0
Personnel Specialist	GS-09	1.0
Budget Analyst	GS-05/07	1.0
Purchasing Agent	GS-05/06	1.0
Secretary	GS-05	1.0
Secretary ²	GS-05	1.0
Administrative Technician ³	GS-05	1.0
Dispatcher	GS-04/05	1.0
Program Clerk ⁴	GS-05	1.0
Maintenance Mechanic – 2 positions	WG-09	1.0/each
Maintenance Mechanic (West Side)	WG-09	1.0
Maintenance Worker ⁵	WG-04	1.0
Maintenance Worker	WG-04	1.0
Maintenance Worker	WG-07	1.0
Engineering Equipment Operator ⁶	WG-09	1.0
Engineering Equipment Operator	WG-09	1.0
Automotive Worker ⁷	WG-08	1.0
Maint. Worker/MVO Op. Leader ⁸	WG-05/WL-04	1.0

1. Replaces temporary position 8420-512

2. Replaces temporary position 8420-511

3. Replaces temporary position 8420-505

4. Replaces temporary position 8420-560

5. Replaces temporary position 8420-574

6. Replaces temporary position 8420-580

7. Replaces temporary position 8420-582

8. Replaces temporary position 8420-590

STF Permanent

Clerk-Typist (Administration)	GS-03	0.8
Clerk-Typist (I&RM)	GS-03	0.8
Library Technician	GS-07	0.8
Range/Forestry Technician - 2 positions	GS-05	0.8/each

Seasonal/Temporary

Range/Forestry Technician - 2 positions	GS-05	0.5/each
Park Ranger (Interpretation) - 6 positions	GS-05	0.5/each
Park Ranger (Interpretation) - 6 positions	GS-04	0.5/each
Park Ranger (Resource Management)	GS-05	0.5
Park Ranger (Backcountry) - 3 positions	GS-05	0.5/each
Laborer (Roads and Trail) - 10 positions	WG-03	0.5/each
Motor Vehicle Operator - 10 positions	WG-04	0.5/each

West Side Seasonal Positions:

Park Ranger (Interpretation) - 2 positions	GS-05	0.5/each
Park Ranger (Interpretation) - 2 positions	GS-04	0.5/each
Park Ranger (Visitor Protection) - 2	GS-05	0.5/each
Motor Vehicle Operator - 2 positions	WG-04	0.5/each
Laborer - 2 positions	WG-03	0.5/each

APPENDIX I: COST ESTIMATES (1991 dollars)

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
PROPOSED ACTION			
Modern Subzone			
Extension of Wheeler Peak Scenic Drive (new entrance road)			
Construct 7 miles, 40 mph design speed, 26' paved top	\$3,500,000	\$667,940	\$4,167,940
Park entrance pullout			
Construct 15-20 car paved parking	98,250	18,750	117,000
Desert shrub pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Kious Basin pullout/trailhead			
Construct 15-20 car paved parking	31,440	6,000	37,440
Riparian shrub pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Contemporary ranching pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Pinyon-juniper pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Existing 12-mile Wheeler Peak Scenic Drive			
Rehabilitate 12 miles at existing width; eliminate peak overlook	3,930,000	750,000	4,680,000
Construct Lehman Flats trailer drop-off (1/2 acre surfaced)	65,500	12,500	78,000
Mixed conifer/Osceola ditch pullout			
Construct 5-10 car paved parking and realign road	39,300	7,500	46,800
Restore ditch	32,750	6,250	39,000
Construct 0.1-mile high-standard trail	65,500	12,500	78,000
Mahogany shrub/Mt. Moriah pullout			
Construct 5-10 car paved parking	18,340	3,500	21,840
Construct 1/2-mile wheelchair-accessible paved trail	32,750	6,250	39,000
Construct 400-sq ft viewing platform	26,200	5,000	31,200
Aspen/Lehman Creek pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Spruce-fir/Wheeler Peak cirque overlook			
Construct retaining wall and 5-10 car paved parking	212,220	40,500	252,720
Wheeler Peak summit trailhead			
Construct 10-car paved parking	15,720	3,000	18,720
Wheeler Peak pullout/trailhead			
Construct 50-car paved parking	196,500	37,500	234,000
Provide 2 vault toilets	52,400	10,000	62,400
Great Basin visitor center (Baker Ridge)			
Construct 5,000 sq ft building	1,310,000	250,000	1,560,000

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
60-seat auditorium (710 sq ft)			
exhibit space (1,000 sq ft)			
restrooms (600 sq ft)			
lobby/sales (1,000 sq ft)			
storage (100 sq ft)			
interpretive workspace (300 sq ft)			
superintendent's office/conference room (150 sq ft)			
staff office (150 sq ft)			
natural history association office (150 sq ft)			
Construct viewing deck	65,500	12,500	78,000
Construct 50-car parking lot	78,600	15,000	93,600
Establish picnic area	6,550	1,250	7,800
Landscape	230,560	44,000	274,560
Prepare cave impact study on visitor center placement	52,400	10,000	62,400
Lehman Cave interpretive center			
R; design existing building; remove administration except	131,000	25,000	156,000
2 interpretive offices; expand cave interpretation into administration area; retain concession; provide handicap access			
Obsterate lower-level parking (1/4 acre) and 1.5 miles of road in front of the interpretive center	294,750	56,250	351,000
Upgrade existing self-guide interpretive trail adjacent to interpretive center	3,000	570	3,570
Construct cave ticket sales kiosk/shelter	144,100	27,500	171,600
information office (100 sq ft)			
restrooms (400 sq ft)			
shelter (1,000 sq ft)			
Construct 70-car/30-RV/bus parking	196,500	37,500	234,000
Establish picnic area (12-15 tables)	10,480	2,000	12,480
Construct wheelchair-accessible trail from kiosk to interpretive center	65,500	12,500	78,000
New road alignment			
Realign entrance road/Baker Creek road/new Lehman Cave parking area (1 mile of road); remove existing entrance road south of orchard	750,000	143,130	893,130
New paved road			
Establish paved road from new entrance road junction west to Baker Lake trailhead (3 miles); 20-car parking at trailhead	1,000,000	190,840	1,190,840
Regional highway exhibit shelters			
Construct and install shelters	131,000	25,000	156,000
Baker administrative site (80 acres)			
Construct orientation center	144,100	27,500	171,600
information/orientation/camping permit kiosk (designed to be manned or unmanned, 100 sq ft)			
restroom (400 sq ft)			
storage (50 sq ft)			
Construct 25-car parking	32,750	6,250	39,000

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Landscape	26,000	4,960	30,960
Construct 3,000 sq ft administration building	491,250	93,750	585,000
superintendent's office			
administrative officer's office			
division chiefs' offices			
protection offices			
resource managers' offices			
two conference rooms			
NPS storage			
NHA storage			
restrooms			
lobby/information			
library			
curatorial and records space			
Landscape	78,600	15,000	93,600
Construct residential area			
20-30 apartments	1,375,500	262,500	1,638,000
6 new permanent housing units	785,000	150,000	936,000
playground	26,200	5,000	31,200
Landscape	200,000	38,170	238,170
Construct maintenance area			
B&U shop (2,500 sq ft)	327,500	62,500	390,000
vehicle storage building (heavy equipment, 10,000 sq ft)	1,310,000	250,000	1,560,000
warehouse (1,500 sq ft cold; 1,500 sq ft warm)	275,100	52,500	327,600
parking (1 1/2 acre)	65,000	12,400	77,400
meeting space/offices (500 sq ft)	65,500	12,500	78,000
Berm and landscape	50,000	9,540	59,540
Existing Lehman Cave maintenance and housing area			
Demolish 4 trailers and revegetate	10,480	2,000	12,480
Provide fire cache (500 sq ft heated) and structure to house fire truck	65,500	12,500	78,000
Demolish existing maintenance (two buildings, 5,000 sq ft)	52,400	10,000	62,400
Eliminate sewage lagoons and revegetate 5 acres	65,500	12,500	78,000
Utilities (sewer, water, electricity)*	8,790,100	1,677,500	10,467,600
Campgrounds			
Wheeler Peak campground (37 existing sites; small RV only)			
Add 2 barrier-free sites	6,550	1,250	7,800
Provide 4 vault toilets	104,800	20,000	124,800
Upper Lehman Creek campground (24 existing sites) small RV, small trailer			
Provide 4 vault toilets	104,800	20,000	124,800

*These costs include wastewater treatment and domestic water system development. Wastewater treatment and possibly water system development and their costs are expected to be shared with the town of Baker.

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Lower Lehman Creek campground			
Eliminate and revegetate	39,300	7,500	46,800
New Lehman Flats campground			
Construct 50 paved campsites & interior roads	750,000	143,130	893,130
Provide low-volume flush toilets (3 restroom complex)	314,400	60,000	374,400
Construct 1/8-mile paved entrance and exit road	131,000	25,000	156,000
Provide water, sewer, and electricity hookups for 1 campsite	6,550	1,250	7,800
Grey Cliffs campground			
Eliminate 3 loops of the 4-loop campground (9 acres)	176,850	33,750	210,600
Develop 1 group campground	209,600	40,000	249,600
2 vault toilets			
12 picnic tables			
6 fire grates			
6 paved pull-ins			
1/8-mile paved circulation road			
no water or electricity			
Baker Creek campground (32 existing sites; tent/RV/trailer camping)			
Provide 4 vault toilets	104,800	20,000	124,800
Rural Subzone			
Highland Ridge (unmaintained access/informal parking)			
Establish trailhead	2,620	500	3,120
Big Spring Wash (unmaintained access/informal parking)			
Establish trailhead and corral	6,550	1,250	7,800
Lexington Arch entrance road (11 miles)			
Upgrade from dirt to 2WD gravel	1,080,750	206,250	1,287,000
Establish gravel 10-car parking and trailhead	10,480	2,000	12,480
Big Wash entrance road (9 miles)			
Upgrade from dirt to 2WD gravel	884,250	168,750	1,053,000
Establish gravel 10-car parking and trailhead	10,480	2,000	12,480
Provide corral	6,550	1,250	7,800
Snake Creek			
Upgrade 12-mile road from dirt to 2WD gravel	1,179,000	225,000	1,404,000
Establish 10 rustic campsites along creek	301,300	575,000	358,800
10 vault toilets			
10 picnic tables			
10 fire grates			
Establish 6 rustic cluster campsites	180,760	34,500	215,260
perimeter definition			
2 vault toilets			
6 picnic tables			

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
6 fire grates			
Establish Johnson trailhead parking (10 cars, gravel)	10,480	2,000	12,480
Establish Shoshone trailhead parking (10 cars, gravel)	10,480	2,000	12,480
Provide corral	6,550	1,250	7,800
Strawberry Creek			
Upgrade 5-mile entrance road from dirt to 2WD gravel; establish two 10-car gravel parking areas and trailheads	491,250	93,750	585,000
Establish 7 rustic campsites along creek	210,910	40,250	251,160
perimeter definition			
7 vault toilets			
7 picnic tables			
7 fire grates			
Establish 1 group campground	58,950	11,250	70,200
perimeter definition			
2 vault toilets			
6 picnic tables			
6 fire grates			
1 corral			
Semi-Primitive Day Use Subzone			
Rehabilitate Lehman Creek trail (3.2 miles)	125,760	24,000	149,760
Establish 4-mile high-standard trail at Wheeler Peak pullout/trailhead (0.1-mile segment wheelchair accessible)	163,750	31,250	195,000
Construct 1-mile medium-standard trail at Lexington Arch	26,200	5,000	31,200
Semi-Primitive Subzone			
Rehabilitate existing backcountry trails - 60 miles, approximately \$5 per foot	2,075,000	395,990	2,470,990
Construct new backcountry trails - 24 miles, approximately \$10 per foot	1,660,000	316,790	1,976,790
Construct trail from Strawberry Creek parking lot to Osceola ditch tunnel (1 mile)	26,200	5,000	31,200
TOTAL - DEVELOPMENT	\$37,560,180	\$7,167,960	\$44,728,140
Media Products			
Regional exhibit shelter panels	65,500	12,500	78,000
Exhibits	337,500	64,410	401,910
Interpretive trail exhibits			
20-25 wayside exhibits			
17 trailhead exhibits			
7 campground orientation exhibits			
Rhodes cabin museum exhibits/Lehman Cave ticket sales kiosk	104,800	20,000	124,800
Baker orientation center exhibits	52,400	10,000	62,400

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Baker Ridge visitor center			
lobby treatment	170,300	32,500	202,800
exhibit room	314,400	60,000	374,400
15-minute film	183,400	35,000	218,400
theater installation	26,200	5,000	31,200
Wheeler Peak interactive video	91,700	17,500	109,200
portable exhibit	17,030	3,250	20,280
Lehman Cave interpretive center	393,000	75,000	468,000
new exhibit and film treatment of cave story			
TOTAL - MEDIA	\$ 1,756,230	\$335,160	\$2,091,390
TOTAL - PROPOSED ACTION	\$39,316,410	\$7,503,120	\$46,819,530

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
ALTERNATIVE A			
Modern Subzone			
Existing 12-mile Wheeler Peak road			
Rehabilitate 12 miles at existing width; eliminate peak overlook	\$3,930,000	\$750,000	\$4,680,000
Desert shrub pullout (on existing entrance road)			
Construct 5-10 car paved parking	11,790	2,250	14,040
Construct Lehman Flats trailer drop-off (1/2 acre surfaced)	65,500	12,500	78,000
Mixed conifer/Osceola ditch pullout			
Construct 5-10 car paved parking and realign road	39,300	7,500	46,800
Construct 0.1-mile high-standard trail	65,500	12,500	78,000
Mahogany shrub pullout			
Construct 5-10 car paved parking	18,340	3,500	21,840
Construct 1/4-mile wheelchair-accessible trail	32,750	6,250	39,000
Aspen/Lehman Creek wayside pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Wheeler Peak summit trailhead			
Construct 10-car parking/trailhead	15,720	3,000	18,720
Wheeler Peak pullout/trailhead			
Construct 25-car paved parking	52,400	10,000	62,400
Provide 2 vault toilets	52,400	10,000	62,400
Lehman Cave visitor center			
Rehabilitate; remove administration except for 2 offices for interpreters; redesign to tell both the cave and Great Basin stories; retain orientation/ticket sales/concession function	131,000	25,000	156,000
Construct new 50-space parking area on site of existing picnic area for RVs/trailers and overflow parking (retain upper and lower parking lots in front visitor center)	98,250	18,750	117,000
Construct wheelchair-accessible trail from parking area to visitor center	65,500	12,500	78,000
Establish picnic area (12-15 tables)	10,480	2,000	12,480
New administration building			
Construct next to the new 50-space parking area	491,250	93,750	585,000
Residential area			
Construct 20-25 new apartments	1,375,500	262,500	1,638,000
Construct 3-6 additional single family units	786,000	150,000	936,000
Maintenance			
Move material storage to gravel pit; rehabilitate gravel pit	65,500	12,500	78,000
Utilities (water, sewer, electricity)	550,200	105,000	655,200

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Campgrounds			
Wheeler Peak campground			
Provide 4 vault toilets	104,800	20,000	124,800
Upper Lehman Creek campground			
Provide 4 vault toilets	104,800	20,000	124,800
Lower Lehman Creek campground			
Eliminate and revegetate	39,300	7,500	46,800
New Lehman Flats campground			
Establish 50 paved campsites & interior roads	750,000	143,130	893,130
Provide low-volume flush toilets (3 restroom complex)	314,400	60,000	374,400
Construct 1/4-mile paved entrance and exit road	131,000	25,000	156,000
Provide water, sewer, and electricity hookups for 1 campsite	6,550	1,250	7,800
Rural Subzone			
Grey Cliffs campground			
Eliminate 3 loops of the 4 loop campground (9 acres)	176,850	33,750	210,600
Develop 1 group campground	209,600	40,000	249,600
2 vault toilets			
12 picnic tables			
6 fire grates			
6 paved pull-ins			
1/4-mile paved road			
no water or electricity			
Baker Creek campground			
Provide 4 vault toilets	104,800	20,000	124,800
Snake Creek			
Grade entrance road for 4WD and 2WD high clearance (12 miles)	157,200	30,000	187,200
Establish 10 rustic campsites along creek	301,300	57,500	358,800
10 vault toilets			
10 picnic tables			
10 fire grates			
Establish 6 rustic cluster campsites	180,780	34,500	215,280
perimeter definition			
2 vault toilets			
6 picnic tables			
6 fire grates			
Establish Johnson trailhead parking (10 cars, gravel)	10,480	2,000	12,480
Establish Shoshone trailhead parking (10 cars, gravel)	10,480	2,000	12,480
Strawberry Creek			
Grade entrance road for 4WD and 2WD high clearance (5 miles)	65,500	12,500	78,000
Establish 5 rustic campsites along creek	210,910	40,250	251,160
perimeter definition			

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
5 vault toilets			
5 picnic tables			
5 fire grates			
Establish backcountry trailhead and parking (10 cars)	10,460	2,000	12,460
Lexington Arch			
Grade entrance road for 4WD and 2WD high clearance (11 miles)	144,100	27,500	171,600
Establish gravel parking area/trailhead (10 cars)	10,480	2,000	12,480
Baker Creek			
Establish gravel parking/trailhead (10 cars)	10,480	2,000	12,480
Semi-Primitive Day Use Subzone			
Rehabilitate Lehman Creek trail (3.2 miles)	125,760	24,000	149,760
Establish 4-mile high-standard trail at Wheeler Peak pullout/trailhead (0.1-mile segment wheelchair accessible)	163,750	31,250	195,000
Semi-Primitive Subzone			
Construct 1-mile medium-standard trail at Lexington Arch	26,200	5,000	31,200
Rehabilitate backcountry trails (36 miles)	1,245,000	237,590	1,482,590
TOTAL - DEVELOPMENT	\$12,484,170	\$2,382,470	\$14,866,640
Media Products			
Exhibits	327,500	62,500	390,000
20-25 wayside exhibits			
17 trailhead exhibits			
7 campground orientation exhibits			
Lehman Cave visitor center	393,000	75,000	468,000
upgrading and rehabilitation; new exhibit and film treatment of both the Great Basin story and the cave			
TOTAL - MEDIA	\$720,500	\$137,500	\$858,000
TOTAL - ALTERNATIVE A	\$13,204,670	\$2,519,970	\$15,724,640

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
ALTERNATIVE B			
Modern Subzone			
Existing 12-mile Wheeler Peak road			
Rehabilitate 12 miles at existing width; eliminate peak overlook	\$3,930,000	\$750,000	\$4,680,000
Desert shrub pullout (on existing entrance road)			
Construct 5-10 car paved parking	11,790	2,250	14,040
Construct Lehman Flats trailer drop-off (½ acre surface)	65,500	12,500	78,000
Mixed conifer/Osceola ditch pullout			
Construct 5-10 car paved parking and realign road	39,300	7,500	46,800
Restore ditch	32,750	6,250	39,000
Construct 0.1-mile high-standard trail	65,500	12,500	78,000
Mahogany shrub pullout			
Construct 5-10 car paved pullout	18,340	3,500	21,840
Construct ¼-mile wheelchair-accessible paved trail	32,750	6,250	39,000
Construct viewing platform (400 sq ft)	26,200	5,000	31,200
Aspen/Lehman Creek pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Spruce-fir/Wheeler Peak cirque overlook			
Construct retaining wall and 5-10 car paved parking	212,220	40,500	252,720
Wheeler Peak summit trailhead			
Construct 10-car parking/trailhead	15,720	3,000	18,720
Wheeler Peak pullout/trailhead			
Construct 40-car paved parking	80,000	15,270	95,270
Provide 2 vault toilets	52,400	10,000	62,400
Lehman Cave visitor center			
Eliminate visitor center and upper and lower parking lots and revegetate	131,000	25,000	156,000
Construct contact/cave ticket sales kiosk/shelter	196,500	37,500	234,000
information office (100 sq ft)			
restroom (400 sq ft)			
shelter (1,000 sq ft)			
Construct 70-car/30-RV parking	196,500	37,500	234,000
Establish picnic area (12-15 tables)	10,480	2,000	12,480
Construct wheelchair-accessible trail from kiosk to cave	65,500	12,500	78,000
Open natural cave entrance for interpretation			
New entrance road alignment			
Establish new entrance to Lehman Caves parking area; remove old entrance road south of orchard	655,000	125,000	780,000
Regional highway exhibit shelters			
Construct and install shelters	131,000	25,000	156,000

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Baker administrative site (80 acres)			
Construct visitor center/administration building (8,000-10,000 sq ft)	1,965,000	375,000	2,340,000
75-car/RV parking	78,600	15,000	93,600
landscaping	26,000	4,960	30,960
Construct residential area			
25-30 apartments	1,441,000	275,000	1,716,000
11-15 new permanent housing units	1,965,000	375,000	2,340,000
playground	26,200	5,000	31,200
landscaping	200,000	38,170	238,170
Construct maintenance area			
B&U shop (2,000 sq ft)	327,500	62,500	390,000
vehicle storage building (heavy equipment; 10,000 sq ft)	1,310,000	250,000	1,560,000
warehouse (1,500 sq ft cold; 1,500 sq ft warm)	275,100	52,500	327,600
parking (1/2 acre)	65,500	12,500	78,000
meeting space/offices (500 sq ft)	65,500	12,500	78,000
berm and landscaping	50,000	9,540	59,540
demolition of existing maintenance (2 bldgs, 5,000 sq ft)	52,400	10,000	62,400
eliminate sewage ponds and revegetate 5 acres	65,500	12,500	78,000
fire cache (heated; 500 sq ft)	65,500	12,500	78,000
Existing NPS housing and maintenance area			
Eliminate housing and maintenance areas and revegetate	262,000	50,000	312,000
Utilities (sewer, water, electricity)*	8,233,350	1,571,250	9,804,600
Campgrounds			
Eliminate Wheeler Peak campground	65,500	12,500	78,000
Upper Lehman Creek campground			
Provide 4 vault toilets	104,800	20,000	124,800
Lower Lehman Creek campground			
Eliminate and revegetate	39,300	7,500	46,800
New Lehman Flats campground			
Construct 100 paved campsites	1,500,000	286,260	1,786,260
Provide low-volume flush toilets (6 restroom complex)	628,800	120,000	748,800
Construct 1/4 mile paved entrance and exit road	131,070	25,000	156,000
Provide water, sewer, and electricity hookups for 1 campsite	6,550	1,250	7,800
Rural Subzone			
Lexington Arch entrance road (11 miles)			
Upgrade from dirt to 2WD gravel	1,080,750	206,250	1,287,000
Establish gravel parking/trailhead (10 cars)	10,480	2,000	12,480

*These costs include wastewater treatment and domestic water system development. Wastewater treatment and possibly water system development and their costs are expected to be shared with the town of Baker.

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Snake Creek			
Upgrade 12-mile entrance road from dirt to 2WD gravel	1,179,000	225,000	1,404,000
Eliminate all campsites on Snake Creek and revegetate	26,200	5,000	31,200
Establish 15-car gravel parking and backcountry trailhead	20,960	4,000	24,960
Strawberry Creek			
Upgrade 5-mile entrance road from dirt to 2WD gravel	491,250	93,750	585,000
Establish 15-campsite rustic cluster campground	432,300	82,500	514,800
perimeter definition			
15 vault toilets			
15 picnic tables			
15 fire grates			
corral			
Establish backcountry trailhead with 10-car gravel parking	10,480	2,000	12,480
Establish Osceola ditch trailhead with 10-car gravel parking	10,480	2,000	12,480
Baker Creek campground			
Provide 4 vault toilets	104,800	20,000	124,800
Grey Cliffs campground			
Eliminate 3 loops of existing 4-loop campground (9 acres)	176,850	33,750	210,600
Develop 1 group campground	209,600	40,000	249,600
2 vault toilets			
12 picnic tables			
6 fire grates			
6 paved pull-ins			
1/8 mile paved circulation road			
no water or electricity			
Baker Creek trailhead			
Establish 10-car gravel parking	10,480	2,000	12,480
Baker Ridge overlook/pullout			
Establish gravel (fill) parking for 15-20 cars	39,300	7,500	46,800
Provide 10 picnic tables	3,000	570	3,570
Establish 1/4-mile high-standard trail	131,000	25,000	156,000
Semi-Primitive Day Use Subzone			
Rehabilitate Lehman Creek trail (3.2 miles)	125,760	24,000	149,760
Establish a 4-mile high-standard trail at Wheeler Peak pullout/trailhead (0.1-mile segment wheelchair accessible)	163,750	31,250	195,000

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Semi-Primitive Subzone			
Rehabilitate existing backcountry trails - 38 miles			
Construct new backcountry trails - 10 miles	1,310,000	250,000	1,560,000
Construct trail from Strawberry Creek trailhead to Osceola ditch tunnel (1 mile)	694,300	132,500	826,800
Upgrade and redesign trail from Lexington trailhead to arch	26,200	5,000	31,200
	26,200	5,000	31,200
TOTAL - DEVELOPMENT	\$31,213,480	\$5,956,770	\$37,170,250
Media Products			
Regional exhibit shelter panels			
Exhibits	65,500	12,500	78,000
20-25 wayside exhibits	327,500	62,500	390,000
17 trailhead exhibits			
7 campground orientation waysides			
Rhodes cabin museum exhibits/Lehman Cave contact/cave ticket sales kiosk	104,800	20,000	124,800
Baker guard station visitor center			
lobby treatment	170,300	32,500	202,800
exhibit room	314,400	60,000	374,400
15-minute film	183,400	35,000	218,400
theater installation	26,200	5,000	31,200
Wheeler Peak interactive video	91,700	17,500	109,200
portable exhibit	17,030	3,250	20,280
TOTAL - MEDIA	\$1,300,830	\$248,250	\$1,549,080
TOTAL - ALTERNATIVE B	\$32,514,310	\$6,205,020	\$38,719,330

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
ALTERNATIVE C			
Modern Subzone			
Extension of Wheeler Peak Scenic Drive (new entrance road)			
Construct 7 miles, 40 mph design speed, 26' paved top	\$3,500,000	\$667,940	\$4,167,940
Park entrance pullout			
Construct 5-10 car paved parking	65,500	12,500	78,000
Desert shrub pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Kious Basin pullout/trailhead			
Construct 15-20 car paved parking	31,440	6,000	37,440
Riparian shrub pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Contemporary ranching pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Pinyon-juniper pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Existing 12-mile Wheeler Peak Scenic Drive			
Rehabilitate 12 miles at existing width; eliminate peak overlook	3,930,000	750,000	4,680,000
Construct Lehman Flats trailer drop-off (1/2 acre surfaced)	65,500	12,500	78,000
Mixed conifer/Osceola ditch pullout			
Construct 5-10 car paved parking and realign road	39,300	7,500	46,800
Restore ditch	32,750	6,250	39,000
Construct 0.1-mile high-standard trail	65,500	12,500	78,000
Mahogany shrub/Mt. Moriah pullout			
Construct 5-10 car paved parking	18,340	3,500	21,840
Construct 1/4-mile wheelchair-accessible paved trail	32,750	6,250	39,000
Construct 400-sq ft viewing platform	26,200	5,000	31,200
Aspen/Lehman Creek pullout			
Construct 5-10 car paved parking	11,790	2,250	14,040
Spruce-fir/Wheeler Peak cirque overlook			
Construct retaining wall and 5-10 car paved parking	212,220	40,550	252,770
Wheeler Peak summit trailhead			
Construct 10-car paved parking	15,720	3,000	18,720
Wheeler Peak pullout/trailhead			
Construct 50-car paved parking	196,500	37,500	234,000
Provide 2 vault toilets	52,400	10,000	62,400
Great Basin visitor center (Kious Basin)			
Construct 5,000 sq ft building	1,310,000	250,000	1,560,000
75-seat auditorium (750 sq ft)			
exhibit space (1,000 sq ft)			
restrooms (600 sq ft)			
lobby/sales (1,000 sq ft)			

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
storage (100 sq ft)			
interpretive workspace (300 sq ft)			
superintendent's office/conference room (150 sq ft)			
staff office (150 sq ft)			
natural history association office (150 sq ft)			
Construct viewing deck	65,500	12,500	78,000
Construct 50-car parking lot	78,600	15,000	93,600
Establish picnic area	6,550	1,250	7,800
Landscape	230,560	44,000	274,560
Lehman Cave interpretive center			
Redesign existing building; remove administration except 2 interpretive offices; expand cave interpretation into administration area; retain concession; provide handicap access	131,000	25,000	156,000
Obliterate lower-level parking (1/4 acre) and 1.5 miles of road in front of the interpretive center	294,750	56,250	351,000
Upgrade existing self-guide interpretive trail adjacent to interpretive center	3,000	570	3,570
Construct cave ticket sales kiosk/shelter	144,100	27,500	171,600
information office (100 sq ft)			
restrooms (400 sq ft)			
shelter (1,000 sq ft)			
Construct 70-car/30-RV/bus parking	196,500	37,500	234,000
Establish picnic area (12-15 tables)	10,480	2,000	12,480
Construct wheelchair-accessible trail from kiosk to interpretive center	65,500	12,500	78,000
New road alignment			
Realign entrance road/Baker Creek road/new Lehman Cave parking area (1 mile of road); remove existing entrance road south of orchard	750,000	143,130	893,130
New paved road			
Establish paved road from new entrance road junction west to Baker Lake trailhead (3 miles); 20-car parking at trailhead	1,000,000	190,840	1,190,840
New paved road			
Pave Snake Creek Road (12 miles) from NV 487 to Shoshone campground	8,400,000	1,596,000	9,996,000
Regional highway exhibit shelters			
Construct and install shelters	131,000	25,000	156,000
Baker administrative site (80 acres)			
Construct orientation center	144,100	27,500	171,600
information/orientation/camping permit kiosk (designed to be manned or unmanned; 100 sq ft) restroom (400 sq ft) storage (50 sq ft)			
Construct 25-car parking	32,750	6,250	39,000
Landscape	26,000	4,960	30,960
New administration building in Lehman Cave developed area			
Construct 3,000 sq ft building	491,250	93,750	585,000

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
superintendent's office			
administrative officer's office			
division chiefs' offices			
protection offices			
resource managers' offices			
two conference rooms			
NPS storage			
NHA storage			
restrooms			
lobby/information			
library			
curatorial and records space			
Landscape	78,600	15,000	93,600
Residential area			
Expand existing area			
20-30 apartments	1,375,500	262,500	1,638,000
3-6 new permanent housing units	786,000	150,000	936,000
New maintenance area			
Construct new maintenance area at former sewage lagoon site			
B&U shop (2,500 sq ft)	327,500	62,500	390,000
vehicle storage building (heavy equipment; 10,000 sq ft)	1,310,000	250,000	1,560,000
warehouse (1,500 sq ft cold; 1,500 sq ft warm)	275,100	52,500	327,600
parking (1/2 acre)	65,500	12,500	78,000
meeting space/offices (500 sq ft)	65,500	12,500	78,000
fire cache (500 sq ft heated) and structure for fire truck	65,500	12,500	78,000
Berm and landscape	50,000	9,540	59,540
Existing maintenance area and sewage lagoon site			
Remove and revegetate	131,000	25,000	156,000
Relocate emergency generator to new location near Lehman Cave contact/cave ticket kiosk	6,550	1,250	7,800
Utilities (sewer, water, electricity)*	9,490,000	1,811,070	11,301,070
Campgrounds			
Wheeler Peak campground			
Add 2 barrier-free sites	6,550	1,250	7,800
Provide 4 vault toilets	104,800	20,000	124,800
Upper Lehman Creek campground			
Provide 4 vault toilets	104,800	20,000	124,800
Lower Lehman Creek campground			
Eliminate and revegetate	39,300	7,500	46,800

*These costs include wastewater treatment and domestic water system development. Wastewater treatment and possibly water system development and their costs are expected to be shared with the town of Baker.

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
New Lehman Flats campground			
Construct 125 paved campsites	1,850,000	353,050	2,203,050
Provide low-volume flush toilets (3 restroom complex)	314,400	60,000	374,400
Construct 1/8-mile paved entrance and exit road	131,000	25,000	156,000
Provide water, sewer, and electricity hookups for 1 campsite	6,550	1,250	7,800
Grey Cliffs campground			
Eliminate 3 loops of the 4-loop campground (9 acres)	176,850	33,750	210,600
Develop 1 group campground	209,600	40,000	249,600
2 vault toilets			
12 picnic tables			
6 fire grates			
6 paved pull-ins			
1/8-mile paved circulation road			
no water or electricity			
Baker Creek campground (32 existing sites; tent/RV/trailer camping)			
Provide 4 vault toilets	104,800	20,000	124,800
Establish 1 corral	6,550	1,250	7,800
Snake Creek campground			
Establish 3 new limited-service campgrounds (10 sites each) along Lower Snake Creek and in the Bonita mine and Shoshone areas	982,500	187,500	1,170,000
Establish 1 corral	6,550	1,250	7,800
Rural Subzone			
Big Wash			
Upgrade 6-mile road from dirt to 2WD gravel	589,500	112,500	702,000
Establish 10-car gravel parking/trailhead, 5 primitive campsites, and corral	19,650	3,750	23,400
Lexington Arch entrance road			
Upgrade 15-mile road from dirt to 2WD gravel	1,473,750	281,250	1,755,000
Establish 2 gravel parking/trailheads (10 cars each)	20,960	4,000	24,960
Decathlon Canyon/Highland Ridge			
Upgrade 20-mile road from dirt to 2WD gravel	1,965,000	375,000	2,340,000
Establish two 10 car gravel parking/trailheads, five primitive campsites, and corral	28,820	5,500	34,320
Strawberry Creek			
Upgrade 5-mile entrance road from dirt to 2WD gravel; establish two 10-car gravel parking areas and trailhead	491,250	93,750	585,000
Establish 7 rustic campsites along creek	210,910	40,250	251,160
perimeter definition			
7 vault toilets			
7 picnic tables			
7 fire grates			

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Establish 1 group campground	58,950	11,250	70,200
perimeter definition			
2 vault toilets			
6 picnic tables			
6 fire grates			
1 corral			
Mt. Washington			
Upgrade 5-mile entrance road from dirt to 2WD gravel from US 93 to Lincoln Canyon mine	1,750,000	333,970	2,083,970
Upgrade 5-mile segment from impassable to 4WD access from Lincoln Canyon	655,000	125,000	780,000
Construct visitor contact station (1,000 sq ft)	262,000	50,000	312,000
Construct 10-15 car gravel parking area/trailhead	26,200	5,000	31,200
Construct ranger residence	131,000	25,000	156,000
Construct utilities	655,000	125,000	780,000
generator			
septic system			
potable water development			
Semi-Primitive Day Use Subzone			
Rehabilitate Lehman Creek trail (3.2 miles)	125,760	24,000	149,760
Establish 4-mile high-standard trail at Wheeler Peak pullout/trailhead (0.1-mile segment wheelchair accessible)	163,750	31,250	195,000
Construct 1-mile medium-standard trail at Lexington Arch	26,200	5,000	31,200
Develop a loop interpretive trail for the Mt. Washington bristlecone forest (2 miles)	78,600	15,000	93,600
Semi-Primitive Subzone			
Rehabilitate existing backcountry trails - 60 miles	2,075,000	395,990	2,470,990
Construct new backcountry trails - 25 miles	1,729,000	329,960	2,058,960
Construct trail from Strawberry Creek parking lot to Osceola ditch tunnel (1 mile)	26,200	5,000	31,200
Construct 6 shelters	78,600	15,000	93,600
TOTAL - DEVELOPMENT	\$52,566,810	\$10,024,820	\$62,591,630
Media Products			
Regional exhibit shelter panels	65,500	12,500	78,000
Exhibits	337,500	64,410	401,910
Interpretive trail exhibit			
20-25 wayside exhibits			
17 trailhead exhibits			
7 campground orientation waysides			
Rhodes cabin museum exhibits/Lehman Cave ticket sales kiosk	104,800	20,000	124,800
Baker orientation center exhibits	52,400	10,000	62,400

	Gross Construction Cost	Advance & Project Planning Cost	Total Project Cost
Mt. Washington contact station exhibits			
Kious Basin visitor center	52,400	10,000	62,400
lobby treatment			
exhibit room	170,300	32,500	202,800
15-minute film	314,400	60,000	374,400
theater installation	183,400	35,000	218,400
Wheeler Peak interactive video	26,200	5,000	31,200
portable exhibit	98,250	18,750	117,000
	17,030	3,250	20,280
TOTAL - MEDIA	\$1,422,180	\$271,410	\$1,693,590
TOTAL - ALTERNATIVE C	\$53,988,990	\$10,296,230	\$64,285,220

APPENDIX J: CONSTRUCTION PHASING – PROPOSED ACTION

Phase I

Construct Wheeler Peak parking/trailhead	\$ 296,400
Construct or rehabilitate trails in semi-primitive day use subzone at Wheeler Peak cirque	344,760
Construct visitor center and associated improvements	3,032,640
Construct Baker administrative site and improvements (administration building, maintenance area, housing, orientation center), and rehabilitate vacated park areas	6,471,360
Construct utility systems and new sewage treatment facilities; rehabilitate existing lagoon areas in the park	10,545,600
Total – Phase I	\$20,690,760

Phase II

Redesign Lehman Cave interpretive center; construct parking, cave ticket sales kiosk, and associated facilities	\$ 1,599,450
Pave Baker Creek road	1,190,840
Rehabilitate existing portion of Wheeler Peak Scenic Drive	5,299,320
Extend Wheeler Peak Scenic Drive (new entrance road) to Nevada 487	4,378,540
Realign roads in Lehman Cave vicinity, construct new spur road to cave, and obliterate old road	893,130
Construct and install trailhead and wayside exhibits	401,910
Total – Phase II	\$13,763,190

Phase III

Make improvements to existing campgrounds	\$ 889,200
Construct new Lehman Flats campground	1,431,330
Make improvements to existing unpaved roads, establish facilities in rural subzone, and construct trail to Lexington Arch	5,332,080
Construct or rehabilitate trails in semi-primitive subzone	4,478,990
Construct and install regional highway exhibit shelters	234,000
Total – Phase III	\$12,365,600

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